# Mushrooms of Algonquin Provincial Park

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**WARNING: Do not use this guide alone to identify any mushrooms intended for food.**

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**Cover Photo:** These Tawny Cystodermas (described on page 13) grew on a mossy, rotten poplar log near McManus Lake, on the east side of Algonquin Park. Mushrooms reveal a

# Mushrooms of Algonquin Provincial Park

Mushrooms and other fungi have a unique appeal and beauty, and Algonquin Park is a good place to see and enjoy them. Anyone who takes a walk in Algonquin, in any season, will see a variety of fungi. During the summer and fall, brightly coloured umbrella-shaped mushrooms, candelabra corals and puffballs may add delight to a woodland walk. The spring brings its own special mushroom season, starring the morels and false morels. During the winter, when the wildflowers are covered with snow, a snowshoer will see bracket fungi and other wood-rotting fungi on the trunks and branches passing by. Some of these even produce spores on the warmer winter days.

Familiar and yet unknown, fungi are everywhere and are an immensely important group of organisms. Every day we see them, walk by or on them, and even breathe and eat them (whether we want to or not), yet most of us know little about them. The mystery of mushrooms has always been a part of their appeal, but we hope that your interest and enjoyment in them will be increased by a better understanding of what they are, and the important roles that these fungi play.

The first question that must be answered is what mushrooms really are. Mushrooms are fungi, and fungi are now classified as a kingdom, ranking equally with the plant kingdom and animal kingdom. Fungi, unlike plants, cannot make their own food, but absorb their requirements from plant or animal materials. They do this in much the same way that plant roots absorb water and minerals from the soil, except that the fungi usually must first digest the material they are growing through. This is the process of decay that we are all familiar with. Fungi are the major decay organisms in the world. The part of the fungus that digests and gathers food (thereby causing decay), and lives from year to year in many species, is a network of thread-like cells called spawn, or mycelium. When conditions are just right and enough food has been gathered, the hidden mycelium of certain groups of fungi produce large and fleshy fruiting bodies that we call mushrooms. The showy red berries of the Bunchberry and the stately white mushroom of the Destroying Angel have the same purpose: to achieve dispersal and reproduction. To do this, a flowering plant produces seeds; a mushroom produces microscopic equivalents called spores. And, just as only some plants produce particularly conspicuous flowers and fruits, it is also true that only certain fungi produce large and showy fruits. The blue spots on your stale bread are also the reproductive structures of a fungus (a mold), but you would scarcely call them mushrooms, and we have not included these or other inconspicuous, but important, fungi in this book.

If you think that there are too many fungi for you to ever know them all, you are quite right. There are probably more than 5000 species of conspicuous fungi in Ontario, and nearly 1000 have been found in Algonquin Park. Many remain to be discovered. However, you don't let the fact that you can't identify all the plants stop you from recognizing (or even eating) raspberries and blueberries. The same is true with fungi. You can easily learn the major groups, and will soon find yourself identifying common and distinctive species such as the Chanterelle and Destroying Angel.

R. Greg Thorn

R. Greg Thorn

2 **Mushrooms, including the Fly Agaric, are fruiting bodies (or fruits) of fungi that live unseen as a mass of thread-like cells, the mycelium (above)**

In the following few pages we present 65 typical conspicuous fungi of Algonquin arranged in the major groups that are easily recognized in the field: slime molds (not true fungi, but fungus-like), cup fungi and their relatives, and the club fungi.

Because they are so poorly known, most fungi do not have widely accepted English or French common names. We have supplied or created English and French names for your convenience, but have also included the scientific (Latin) names, which are the ones you will need to know to find a particular species in another book. It must be admitted, furthermore, that even scientific names are not always agreed on; those used in this book follow "The Agaricales in Modern Taxonomy" (4th edition, Singer, 1986), "British Ascomycetes" (Dennis, 1978) and other modern authorities.

## Pathogens, Partners and Rotters

One reason for the variety of fungi is the many different roles that fungi play. Some fungi are pathogens, causing diseases in plants or animals (see the Maple Canker and Honey Mushroom). Many more fungi (the Fly Agaric, and many others) are important partners to green plants, providing essential mineral nutrients. Still other fungi (particularly the club fungi) are involved in rot, the return of dead plant or animal matter to the soil through the process of decay. Many fungi are specialists, and are pathogens, partners or rotters of a particular plant species or group. This is another reason for the numbers of fungi in Algonquin Park, for Algonquin has a diverse flora, with varied habitats, or plant communities, and a mixture of plants from north and south. The ranges of certain fungi that are common in the tropics extend north to Algonquin, yet other Algonquin species can be found north to the tree line.

In short, the staggering variety of fungi that we see in terms of sheer numbers and variety of fruiting body forms, is a result of fungi having taken advantage of every available food resource, and trying every ingenious mechanism for optimum production, release, and distribution of spores.

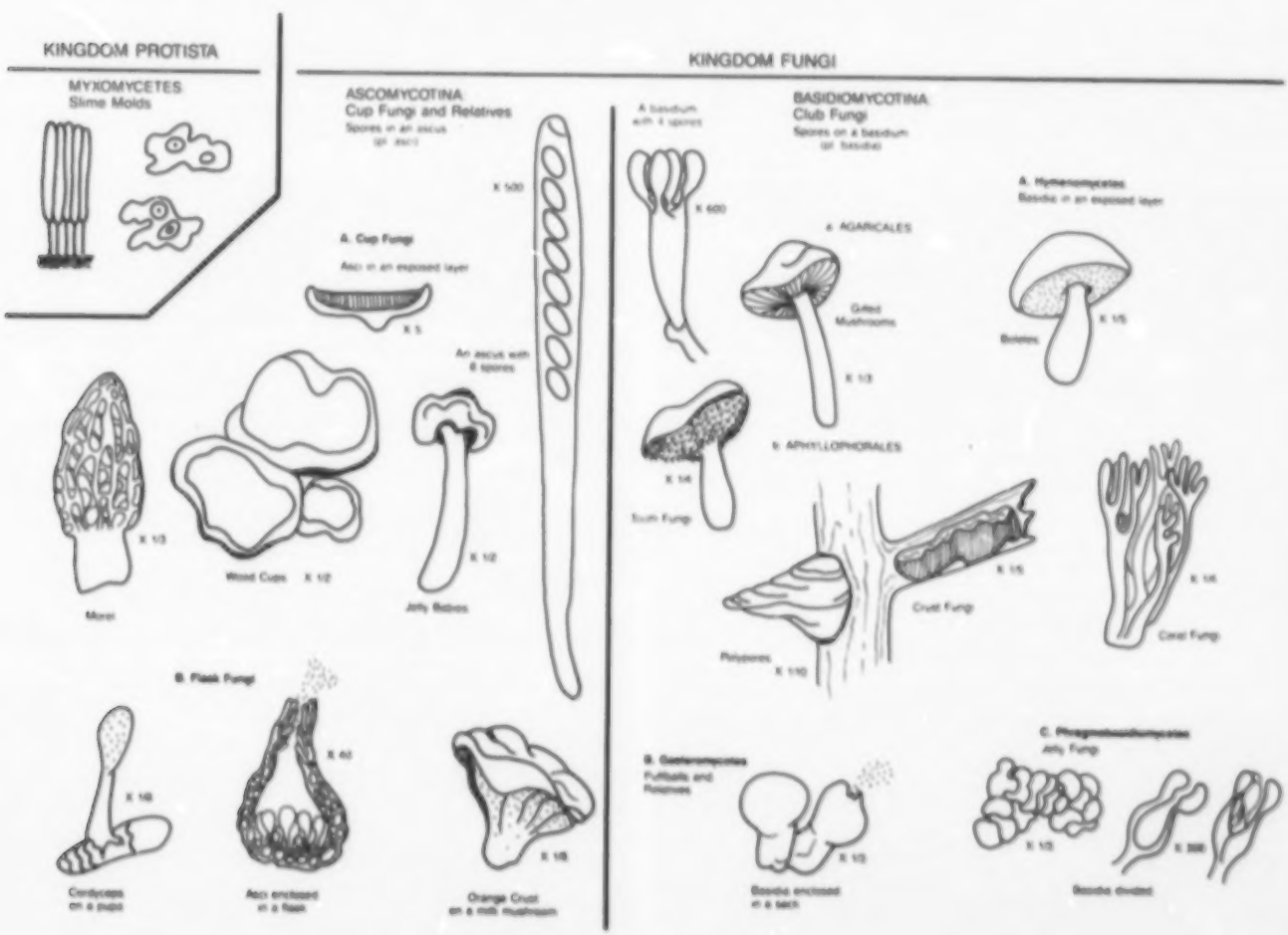
## Picking Mushrooms

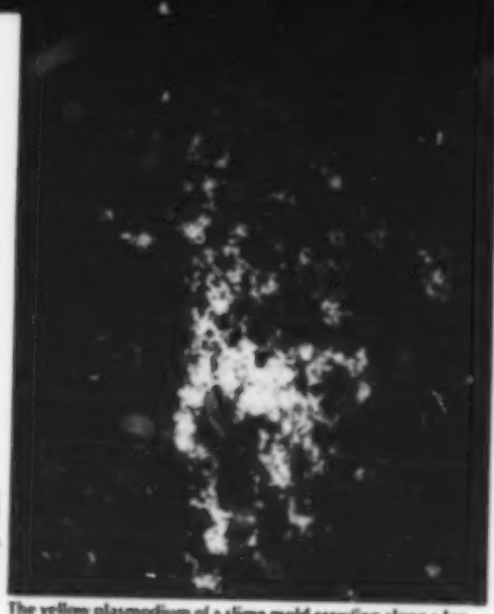
The first question that most people ask about a wild mushroom is, "Is it edible?" We hope that when you have read more of this book you will believe us when we say that there is much more to the fungi than their edibility. On the other hand, frying up a pan of fresh-picked Oyster Mushrooms is as legitimate an Algonquin experience as eating blueberries, any day. Cooking up wild mushrooms can provide a variety of delicious tastes, and a sense of satisfaction, that can not be obtained from the store-bought varieties.

**But first, a warning: Do not use this guide alone to identify any mushrooms intended for food.** The only way to know whether a mushroom is edible or poisonous is to know what it is. This booklet illustrates only 65 mushrooms out of the nearly 1000 known from Algonquin. Poisonous look-alikes that may exist have not been included. Mushroom poisoning can range from unpleasant to fatal. Lethal mushrooms are common in Algonquin, as elsewhere, and may look appealing. Choice edible mushrooms that can be recognized as easily and safely as blueberries or raspberries can also be found, but you must be sure of your identification. Never depend on someone else's say so (especially a remembered say so) and never rely on some simple rule of thumb. These are recipes for eventual disaster. Use one or more field guides, such as those listed at the back of this book, to identify yourself any mushrooms that you are considering putting in your mouth. It is, after all, your life.

As we mentioned before, mushrooms are just fungus fruiting bodies. Knowing this, we realize that picking mushrooms is no more harmful to the whole fungus (the extensive mycelium that we can't see) than picking blueberries is harmful to the blueberry bush. Because of this, mushroom picking is not unlawful in Algonquin Park, but we ask of you the following courtesy. Please do not collect mushrooms along self-guiding trails in Algonquin. The mushrooms you pick will not be there for the people following you on the trail to enjoy.

And now, let us introduce you to some of Algonquin's finest fungi.





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The yellow plasmodium of a slime mold crawling along a log

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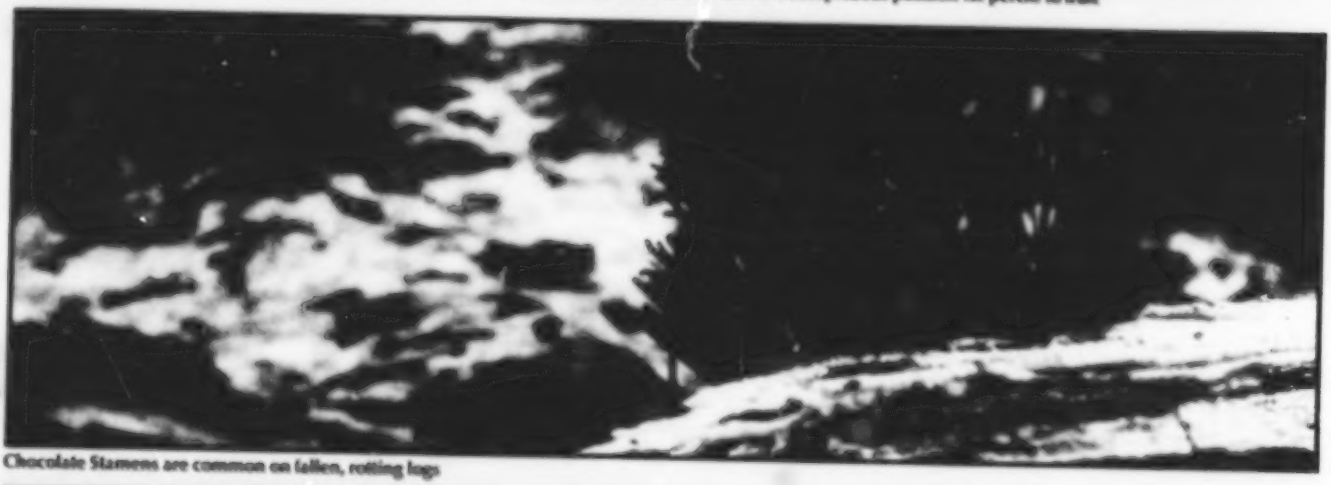
The Brilliant Soot-ball crawls to a conspicuous position (or perch) to fruit



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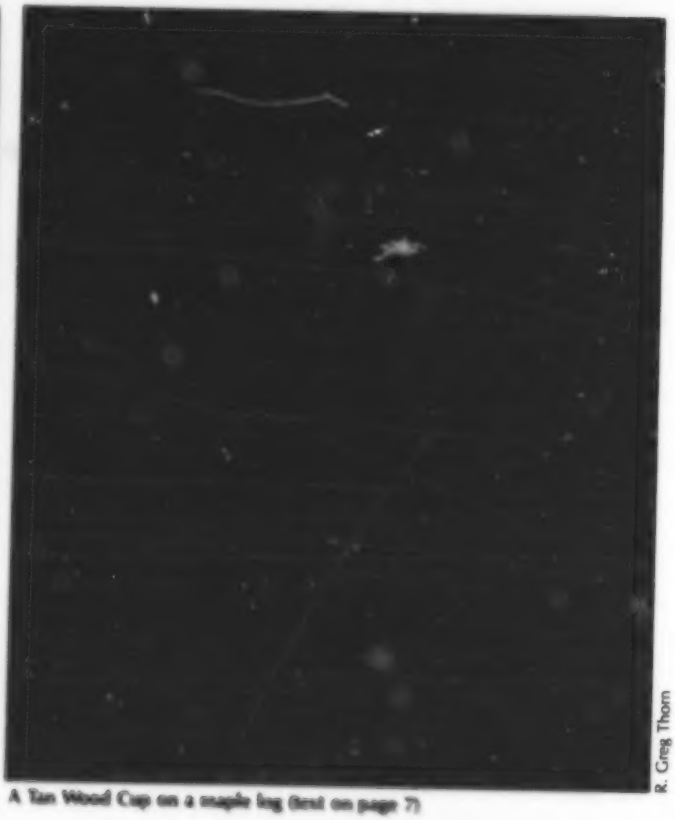
Chocolate Stamens are common on fallen, rotting logs

R. Greg Thorn

Scarlet Fairy Cups grow on hardwood twigs as the snow melts in the spring



R. Greg Thorn

A Tan Wood Cup on a maple log (text on page 7)

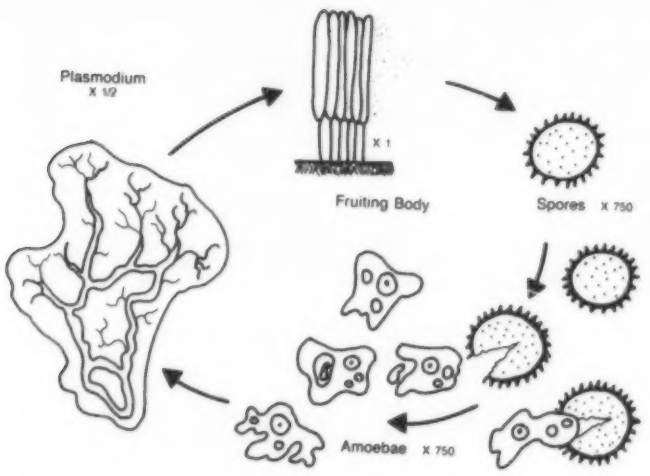
# Slime Molds

*Myxomycetes*

**Myxomycètes** (Champignons visqueux)

The slime molds are peculiar organisms that were once called "fungus animals". During the feeding stage of their life cycle, they move about like animals, but later go on to form a fruiting body that produces spores, much like other fungi. Their spores germinate to release microscopic, single-celled creatures that glide about and engulf small food particles such as bacteria and fungal spores, in a manner very similar to the amoebae you may have studied in school. In fact, because of this resemblance, many biologists now classify the slime molds with amoebae in the kingdom Protista, neither fungus nor plant nor animal. Slime mold "amoebae" can be found in many moist environments, including bark, leaf litter, soil and rotting wood. Soon, they gather in a flowing, slimy mass called a plasmodium that travels through the soil or rotting leaves, and over or around obstacles in its path. As food runs short, or the environment dries out, the plasmodium hurries upward, climbing tree trunks, grass blades, or even buildings to fruit in an elevated position where the breezes can carry its spores to new areas. The young plasmodia of most slime molds are white or yellowish, and not distinctive in appearance, but as they mature they form characteristic and sometimes colourful or bizarre fruiting bodies.

To find and truly appreciate the beauty of the slime molds, you may need to get on your hands and knees and, even better, examine them with a small hand lens. Enthusiasts might even want to take one home: some species make ideal "pets" that can be raised in a jar and fed small bits of oatmeal!




**Life cycle of a slime mold**

## Brilliant Soot-ball

*Fuligo septica*

**Fleur de tan**

This is one of the largest and showiest slime molds, and is common in the hardwood forests of Algonquin. The massive, white or yellow plasmodia crawl up stumps or trunks to form fruiting bodies that are often 10 cm in diameter. The fruiting bodies become crusty as they mature, with a snowy white or golden surface that can be seen from great distances. Beneath this outer surface, the ripe spores are dark and powdery. These spores may be blown away to new localities if the fruiting body breaks up in dry weather, but will be washed back to where they came from if the fruiting mound disintegrates in a heavy rain.

The best time to look for the Brilliant Soot-ball, and most other slime molds, is after a week or so of dry weather that follows a cool, rainy period. Cool moist weather is ideal for slime mold growth and feeding; a dry spell will cause them to form fruiting bodies; but heavy rains will wash these fruiting bodies away.

## Chocolate Stamens

*Stemonitis fusca*

**Etamines couleur chocolat**

Chocolate Stamens may not jump out at you like the Brilliant Soot-ball from a distance of several paces, but a close search of several rotting logs should reward you with a find of these delicately waving powdery brushes. Each fine, black stalk supports a column of chocolate spores packed in a loose microscopic network. If you touch one of these columns, many thousands of spores will be released and drift away on the slightest breeze. It is difficult to imagine how a structure so intricate could have been formed from a mass of amoebae, but that is what happened. Each spore, and every cell in the stalk and network can be traced back to an amoeba that joined the crowd to form the plasmodium that slithered its way to the top of the log, then began to pile up into columns and underwent a metamorphosis to form these powdery brushes.

While you are on your hands and knees, you may well find some more of the nearly 70 slime molds known from Algonquin. Tiny pink candy flosses of *Arcyria*, golden flosses and pretzels of *Hemitrichia*, incredible globe-shaped bird-cages of *Dictydium*, the whitish, lime-encrusted capsules of *Physarum*, and the miniature basalt columns of *Tubifera*: a wealth of intricate beauty awaits you at your feet. Perhaps, already, you are a slime mold devotee.

# Cup Fungi and Relatives

*(Ascomycotina)*

**Champignons Discoïdes et groupes apparentés**

Many people will never see the most important difference between the cup fungi and the club fungi, the two main groups of true fungi included in this book. That is because this difference can only be seen through a microscope. The spores of cup fungi are produced in sack-like cells called asci. The spores of the club fungi, or Basidiomycotina, are produced on pegs, outside club-shaped cells called basidia. On the other hand, even without a microscope we can see that most cup fungi look different than the gilled mushrooms, corals and polypores of the club fungi. As it turns out, the true identity of some "oddball" coral-shaped cup fungi, and some cup-shaped club fungi, was confused until the late 1800s, when scientists examined these fungi microscopically. The cup fungi contain a great variety of forms and colours, from the disc-like Wood Cup to the honey-combed morel, and the Orange Crust, which is little more than a pimply crust over a mushroom. Over 160 cup and flask fungi have been found in Algonquin and undoubtedly far more are present, but many are so small as to be barely conspicuous.

## Scarlet Fairy Cup

*Sarcoscypha austriaca*

**Pézize écarlate**

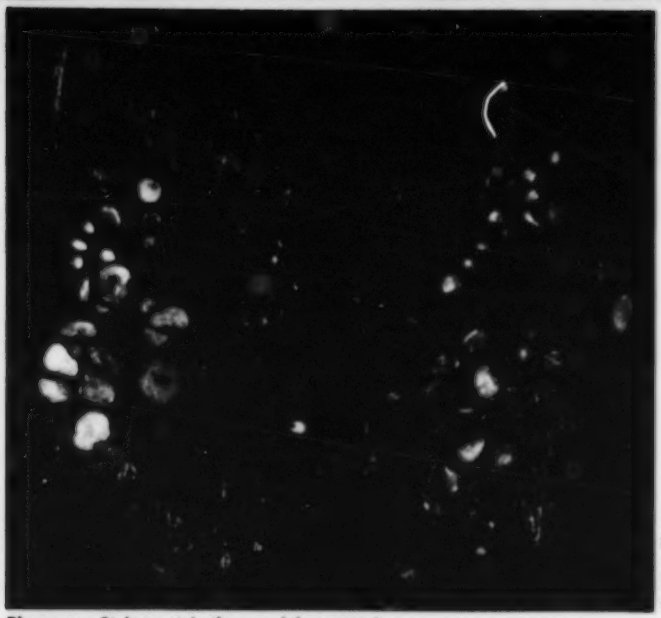
In early May, as the snow melts from the woods, you may find Scarlet Fairy Cups growing on hardwood twigs, partly hidden among the fallen leaf litter. These cups are usually 2 to 4 cm in diameter. Their brilliant red lining produces the spores, and their sterile outer surface is white or pale pink.

This species was previously identified as *Sarcoscypha coccinea*, a name that properly refers to a species restricted to Europe and western North America.

*Caloscypha fulgens*, a similarly shaped orange cup with greenish stains on the outer surface, grows among mosses or in needle carpets under conifers at the same time of year.

R. Greg Thorn

The brilliant Orange-peel Cup fruits on paths and roadsides in the fall



Blue-green Stainers stain the wood they grow in

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A crowd of Yellow Fairy Cups on a hardwood log

R. Greg Thorn

Green-headed Jelly-babies

The Bog Beacon grows from submerged leaves on boggy shores or in woodland pools

## Tan Wood Cup (Photo on page 4)

*Peziza micropus*

**Pézize brune**

The tan-brown, wavy-edged cups of *Peziza micropus* often reach 7 cm across, and are a common sight on rotting hardwood logs in Algonquin from June to September. If you should find one (or an Orange-peel Cup), approach it carefully, watch closely, and blow into it gently. That's right, blow into it! If it is fully mature, and has not been disturbed recently, it should reward you with a puffing release of a cloud of thousands of spores. Many cup fungi release the spores from all of their mature asci (spore-sacks) when they are triggered by a puff of air that might carry their spores to new localities. If at first you don't succeed, try again on the next large cup fungus you come to.

## Orange-peel Cup

*Aleuria aurantia*

**Pézize orangée**

We hope that the orange peel you find along a trail in Algonquin Park is a fungus, *Aleuria aurantia*. In fact, disturbed soils, such as on or along trails and roadways are good spots to look for this species, which ranges from 2 to 10 cm in size. The specimen illustrated was found beside the entry to Pog Lake Campground, and was probably growing from dead wood buried during the grading of the road. The Orange-peel Cup fruits in the fall.

## Yellow Fairy Cups

*Bisporella citrina*

**Cupules citrines**

The striking yellow masses of tiny saucers of *Bisporella* are a common sight on hardwood logs in Algonquin Park, from June to October. Unlike the cups of the Blue-green Stainer, Yellow Fairy Cups grow on the upper side of the logs, and so are very conspicuous. Individual cups range from 3 to 6 mm broad, but the masses of them may extend for several metres along a log. This species and the Blue-green Stainer (both cup fungi) probably make a minor contribution to wood decay, since they both lack the chemicals that many club fungi have that are required for significant breakdown of wood.

## Green-headed Jelly-babies

*Leotia viscosa*

**Léotie à têtes vertes**

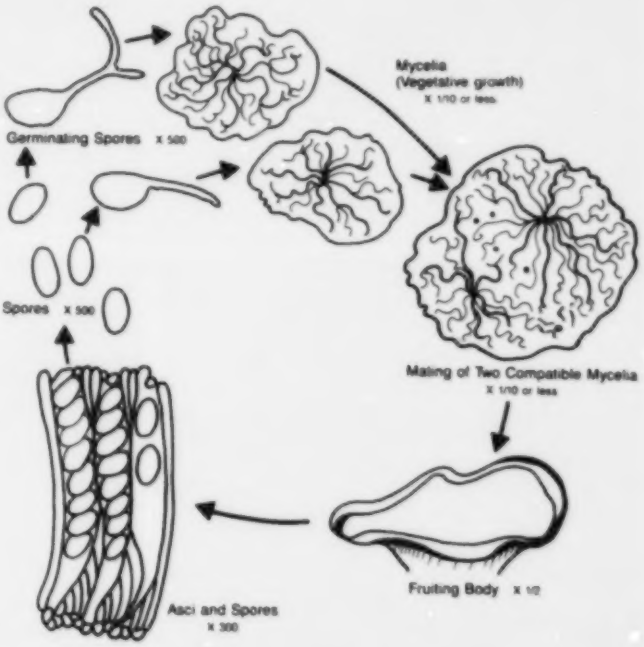
Jelly-babies can be found, singly or in clusters of two to dozens, in the late summer and fall. Three species grow on leaf litter in the mixed woods of Algonquin Park: the Green-headed, the more common but less conspicuous Yellow-headed (*Leotia lubrica*), and the Green Jelly-babies (*Leotia atrovirens*). Their texture is like a stiff jelly, and in wet weather their stalks and undersides of their caps are slimy. Their spores are produced on the upper surface of the cap.

## Blue-green Stainer

*Chlorociboria aeruginosa*

**Cupules turquoises**

You will probably see the blue-green wood stained by this fungus long before you find its 3 to 6 mm broad fruiting bodies. You may have wondered what caused the staining, but if you turn over some of the larger chunks of blue-green wood, anytime from June to October, you should find the culprit. Everything about this fungus is blue-green, and its mycelium imparts that colour to the wood of the maple or other hardwood that it grows through. Wood stained by this fungus was used historically for decorative inlay and bowls.




**Life cycle of a cup fungus**

## Bog Beacon

*Mitrula elegans*

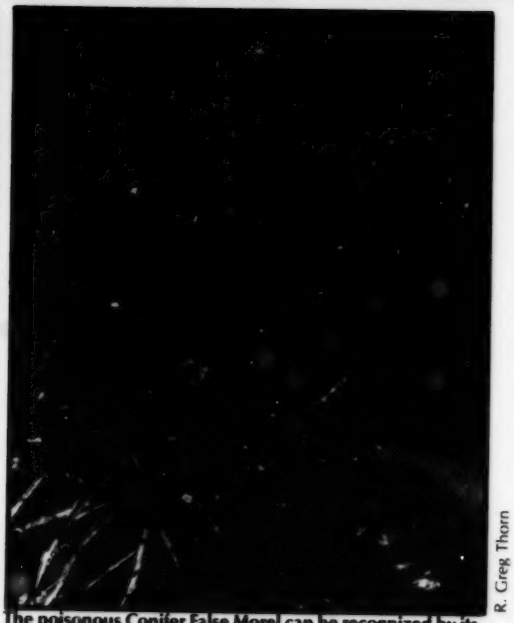
**Mitrule élégante**

If you come to Algonquin Park to fish in the spring and paddle close to a boggy shore, you may see the golden orange heads of the Bog Beacon, shining from among the sphagnum and sedges at the water's edge. Bog Beacons reach a height of about 5 cm and grow from submerged dead leaves that have fallen into the water. On boggy shores, these are usually the leaves of Leatherleaf or Sweet Gale, but the Bog Beacon also grows from submerged leaves in spring pools in the hardwood forest.

The similar Water Club (*Vibrissea truncorum*) lives on dead wood, and actually grows completely submerged in spring runoff, then emerges as the water levels drop, to shed its air-borne spores. Water Clubs are smaller than Bog Beacons (up to 15 mm tall), have round heads, and have dark scales on their stems.

Paul D. Johnson

Black Morels fruit (at the height of the spring wildflower season) in late May



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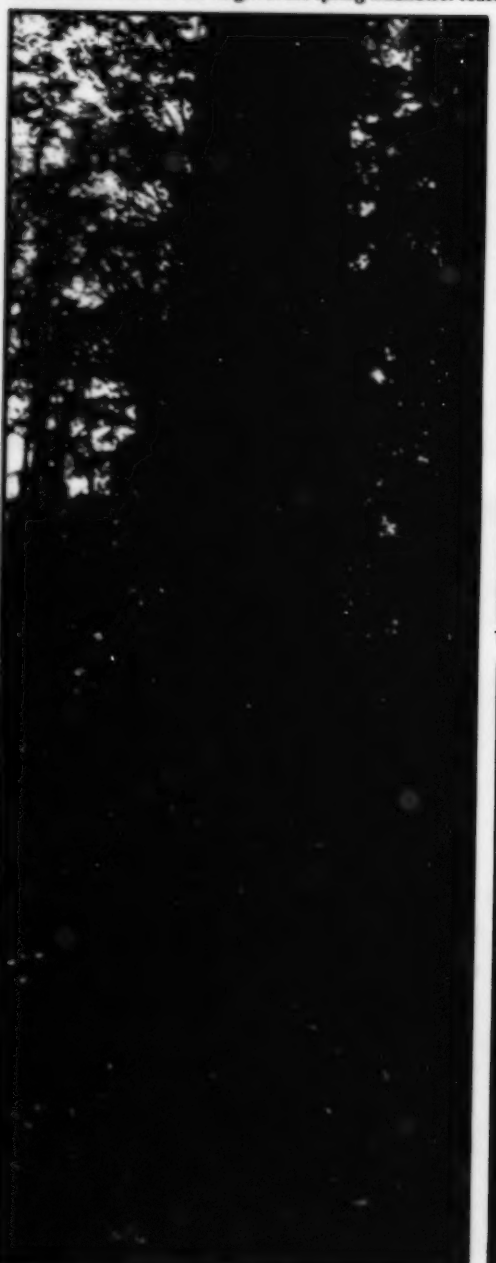
The poisonous Conifer False Morel can be recognized by its wrinkled, brain-like cap



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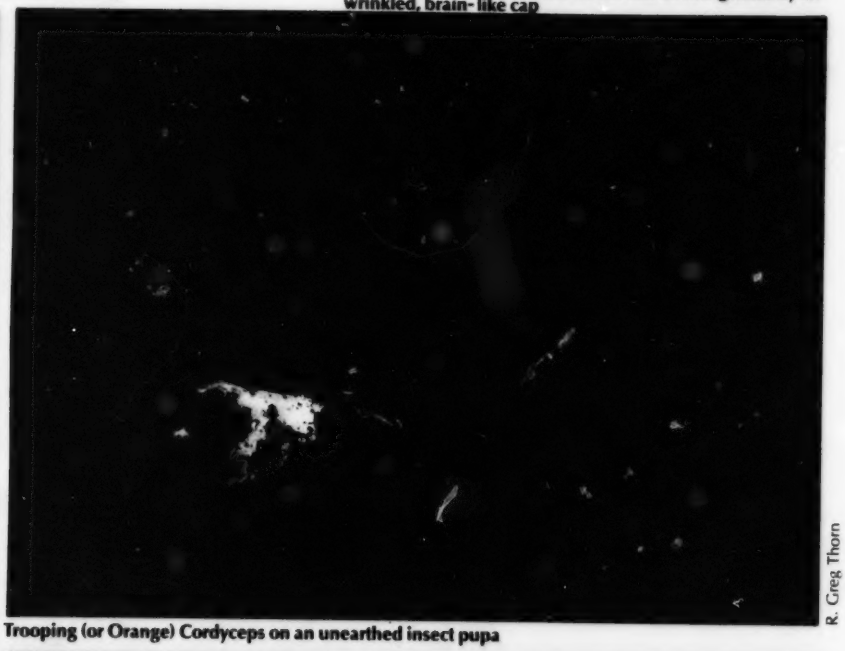
Eutypella Canker on a sugar maple



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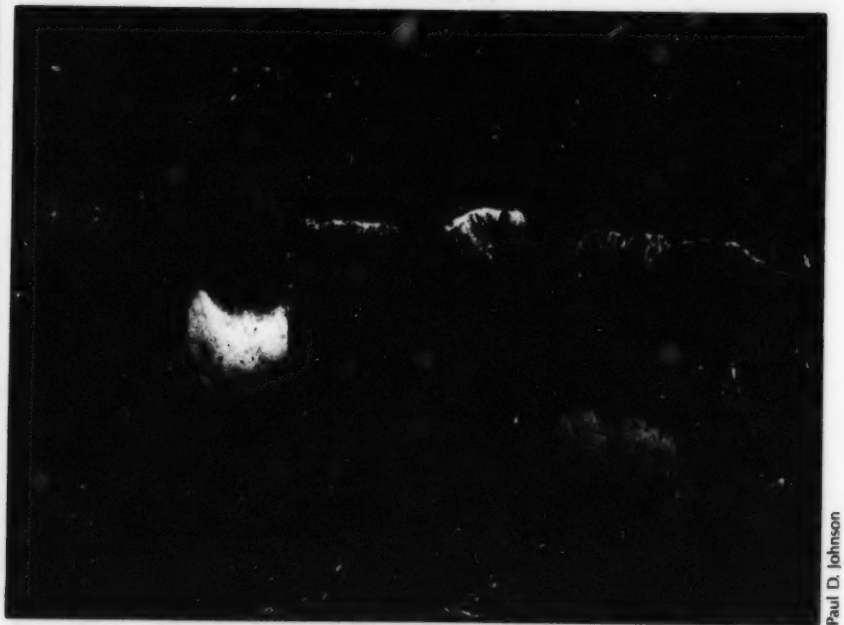
Trooping (or Orange) Cordyceps on an unearthed insect pupa



Paul D. Johnson

Orange Crust on deformed, parasitized milk mushrooms

## Black Morel

*Morchella elata*

**Morille noire**

The Black Morel appears just briefly, at the height of the spring wildflower season, which comes to Algonquin Park in late May. Its conical and honey-combed fruiting body is distinctive. If you consult a mushroom field guide you will see that morels are very easy to recognize. This, and their delicious flavour make morels a favourite with beginning and experienced mushroom-hunters. The biggest problem is actually finding morels, for they are often concealed under low shrubbery or dead, overwintered fronds of Bracken Fern.

The Black Morel is the common northern species in Ontario, growing in poor soils and often found under conifers. The paler Common Morel (*Morchella esculenta*) is found further south, on richer soils that developed over limestone.

Recent research in France has traced the mycelium of related morels from fruiting bodies to thick, woolly or spongy mantles surrounding rootlets of various trees and herbaceous plants, from ashes and elms to dogwoods and dandelions. Hyphae from these mantles penetrate cells in the outer tissues of the root, so it appears that morels are root parasites. Morels are known to fruit abundantly around elms that are dying of dutch elm disease (caused by a flas. fungus named *Ophiostoma ulmi*) and also in forests following disturbances such as fires and logging. It is likely that these mass fruitings represent the morels benefiting from a tremendous surge of nutrients, unfortunately their last, from their host plants.

## Eutypella Canker

*Eutypella parasitica*

**Chancre d'érable**

Throughout the hardwood forests of Algonquin Park are sugar maples with spreading cankers shaped like cobras' hoods. These are caused by the attack of an inconspicuous parasitic fungus, *Eutypella parasitica*. Spores of this fungus that land on a wound, or on the stub of a broken-off branch in a young tree, germinate and form a colony that spreads out to attack living cells in the surrounding wood, just below the bark. The death of these growing cells, and the scar tissue formed as a response by the tree, cause the deformity that becomes the canker as the tree grows older. Maple cankers rarely kill their host tree, except that the trunk may be weakened enough to snap in a wind storm. The fruiting bodies of the fungus that caused the canker are minute, and visible only as black necks protruding from the diseased wood.

## Conifer False Morel

*Gyromitra esculenta*

**Fausse morille** (Moricaude)

The Conifer False Morel fruits at the same time as the Black Morel, and is generally much more common and conspicuous. There is no difficulty in distinguishing the two species by their shape alone, but for many years people considered that they were both equally good edibles. Now it is well known that the false morels contain a poison called gyromitrin that can cause nausea, diarrhea, loss of coordination, and occasionally convulsions and death. In fact, the Conifer False Morels of Algonquin Park are reputed to have the highest concentration of this toxin of any of the North American false morels tested. This toxin may be boiled off during long cooking, but the cook may suffer poisoning from inhaling the vapours!

The Conifer Malse Forel is usually 10 to 15 cm tall, and has a wrinkled head of 6 to 10 cm diameter.

## Trooping Cordyceps (Orange pupal eater)

*Cordyceps militaris*

**Cordyceps orangé**

Only the whitish stalk and orange head of the cordyceps fruiting body shows above the ground. This part is about 2 to 4 cm tall. Despite its common name, the Trooping Cordyceps rarely grows in troops in Algonquin. If, as was done with the specimen pictured opposite, you dig carefully into the soil or rotting wood beneath a Trooping Cordyceps, you will find that it is growing from a parasitized insect. The Trooping Cordyceps most commonly attacks pupae of the larger moths, including sphinx moths, and thus earns its more appropriate English name, the orange pupal eater. Fungi really have evolved to make use of any imaginable food source! This species fruits in the late summer and fall.

The asci (spore sacks) in cordyceps and the next two species are produced in flask-shaped structures, visible as tiny pimples in the orange heads of cordyceps.

## Orange Crust

*Hypomyces lactifluorum*

**Dermatose des russulacées**

The Orange Crust is a fungus on a mushroom; it parasitizes and deforms milk mushrooms and russulas such as *Lactarius vellereus* and *Russula brevipes*. When these mushrooms are common, as they are in July and August in woods with white pines, the Orange Crust may parasitize whole groups in a range of 10 metres. The funnel-like shape of the host mushroom is maintained, but where there should normally be thin, knife-like gills on the underside, there is instead only a wrinkled and pimply orange crust. Beneath the parasitized mushrooms you may find a heavy white spore print on the soil and leaf litter, but the spores are of the Orange Crust, not the russula or milk mushroom host. No one can tell us how those spores get from there to infect another, underground mycelium of a susceptible host, so that when the host mushrooms emerge from the soil, they are already infected and deformed.

R. Greg Thorn

**Clustered Changelings – typical gilled mushrooms**

R. Greg Thorn

**The deadly Destroying Angel has a ring on the stem and a sock at the base**

R. Greg Thorn

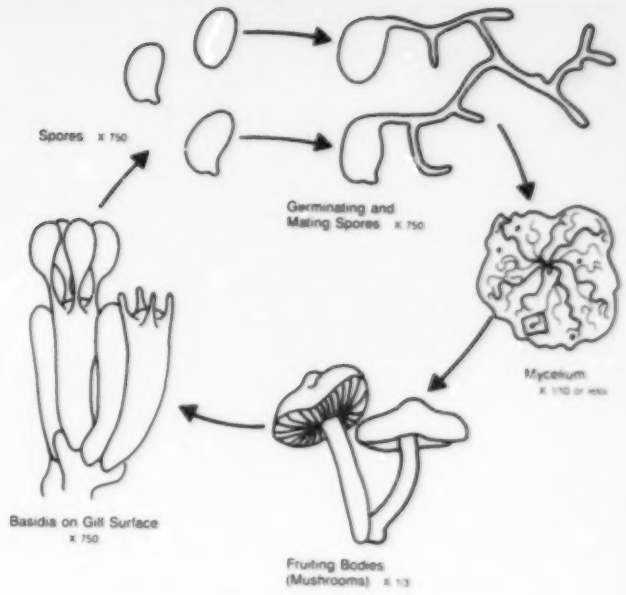
**Fly Agarics**

# Club Fungi

*Basidiomycotina*

**Champignons à basides**

Gilled mushrooms, corals, polypores, crusts and puffballs are just some of the groups belonging to the large and diverse assemblage known as club fungi. The spores of this group are produced on club-shaped cells called basidia. The club fungi are particularly noted for their ability to decay wood. While many fungi, and some bacteria, can digest cellulose, they can't really cause effective wood-rot because they are unable to break down the other major component of wood, the lignin that acts like a glue to bind the cellulose fibers together. A number of the club fungi can break down both cellulose and lignin, causing a thorough breakdown of wood called white-rot. Some of these same fungi may be useful in breaking down toxic wastes such as PCBs, which are chemical relatives of lignin.




**Life cycle of a club fungus**

# Gilled Mushrooms (Agarics)

*Agaricales*

**Champignons à lamelles** (Agarics)

Gilled mushrooms are perhaps the most familiar group of fungi. Some are colourful, some are good edibles, and others are deadly poisonous. A typical gilled mushroom, the Clustered Changeling (*Psathyrella hydrophila*), is illustrated opposite. To identify a mushroom, you must look closely at a number of its features. What colour is the cap? Is it smooth or scaly, slimy or dry, and does it fade with age? What about the stem? Our changeling has a fuzzy base, and a wispy veil over the gills. Amanitas have a skirt-like ring on the stem and a sock at the base. How do the gills attach to the stem, and what colour are the spores that they produce? To determine spore colour, you should make a spore print by cutting the stem off a cap, setting the cap gills-down on white paper, covering the cap with a glass to prevent its drying out, and leaving it several hours or overnight to shed a few million spores (see page 20). Species of *Amanita* have white spores; *Agaricus* and *Psathyrella* have purplish-brown or blackish spores. If you intend to eat the mushrooms you collect, making careful observations and consulting a good field guide may save your life. You may prefer to appreciate the gilled mushrooms simply for their beauty, or because they are the major group involved in fungus-root partnerships, without which most of our trees could not survive.

## Destroying Angel

*Amanita virosa*

**Amanite vireuse**

This species is beautiful, but deadly. Anyone interested in collecting edible wild mushrooms should learn to recognize and avoid the Destroying Angel, and parents should caution their young children not to nibble pretty white mushrooms. The three key features of an *Amanita* (all visible in our photograph) are white gills, a skirt-like ring around the stalk near the cap, and a sock, or volva, at the enlarged base of the stem. The sock at the stem base is the remnant of a veil that surrounded the whole mushroom when it was an egg-shaped button. The skirt, or annulus, covers the gills until the cap expands like an opening umbrella.

The Destroying Angel contains two groups of poisons, amanitins and phalloidins. The phalloidins, it seems, are rendered harmless by our digestion, but the amanitins are not. Cramps, nausea and diarrhea develop 4 to 24 hours after the mushrooms are eaten, but this, unfortunately, is after the amanitins have entered the bloodstream, and too late to begin effective treatment of the poisoning. The amanitins block an enzyme that is involved in reading our DNA (our genetic template) to create proteins, a process that must go on continually to rebuild and replace cells. Cell replacement is especially vital in our kidneys, liver, and the lining of our intestines. After one or two days, the victim may improve enough to leave the hospital and pass the whole episode off as a bad case of the flu, but unless intensive treatment began early, the progress of the poisoning, and the end are inevitable. Retching, diarrhea and cramps return and are followed by liver and kidney failure, convulsions, and a painful death. An antidote that is effective if administered early enough (the "Bastien method") has been developed in France but, for reasons unknown to us, has not been picked up by North American doctors. Only a few victims have been saved on our side of the ocean by intensive hospital care and, occasionally by kidney transplants.

## Fly Agaric

*Amanita muscaria*

**Amanite tue-mouche**

Many of you will recognize the Fly Agaric from illustrations in children's books, or as the classic "toadstool". Its English, French and Latin names (from *musca*, for fly) all refer to the fact that the poisons in this species were used over the centuries as a home remedy to kill household flies. The Fly Agaric is not as poisonous as the Destroying Angel, and is not often lethal to humans, but people who eat it may suffer nausea and diarrhea, loss of coordination, and diverse hallucinations. This species may be the source of the folk term "toadstool". Before we knew better, it was claimed that toads could give you warts if you handled them (they can't). When a toad sat on a Fly Agaric, the mushroom developed warts, became poisonous, and was forever after a "toadstool".

The Fly Agaric is common in Algonquin Park from July until September, under conifers, aspens and White Birch. The Fly Agaric is a partner to each of these trees, and forms a fungus sheath around their modified rootlets (drawing on page 13). The mushroom's mycelium, made up of microscopic, thread-like cells, acts as the tree's root hairs and supplies the tree with essential nutrients such as phosphorus and nitrogen. These nutrients are scarce in Algonquin soils and, without the supply provided by the mushroom, the tree would grow poorly and perhaps die. The tree, in turn, provides sugars from photosynthesis that the mushroom is dependent on. This sheathing mushroom-root relationship, or mycorrhiza, is essential to most of the trees and about 15% of the conspicuous fungi known from the park. Most of the rest of the plants in the park have a different form of mycorrhiza, just as essential, with inconspicuous soil fungi.

R. Greg Thorn

Hornemann's Stropharia has conspicuous scales below the ring on its stem

The Gypsy, among mosses and lichens

William J. Cries

Black shoestrings of the Honey Mushroom grew beneath the bark of a tree it killed

R. Greg Thorn

Honey Mushrooms at the base of a dead tree

R. Greg Thorn

The beautiful Tawny Cystoderma on a rotted poplar log

R. Greg Thorn

Hunters' Hearts are mushrooms parasitized by the Honey Mushroom, seen at the top left of the picture

## Hornemann's Stropharia (Lacerated Stropharia, Luxuriant Ringstalk)

*Stropharia hornemannii*

**Strophaire d'Hornemann**

In moist, mixed or coniferous woods in Algonquin, from late summer until the snow falls, you may find this very elegant and distinctive stropharia. The cap varies from yellowish brown to reddish or purplish brown, and ranges from 5 to 15 cm broad. The stem of this mushroom is its most distinctive feature. It has a flaring, membranous, white ring (often with fine black lines on the upper side from fallen spores) and numerous pointed white scales on the stem below the ring. This species is found on well-rotted conifer logs, or on the ground, where it is probably growing from buried wood. Stropharia species occur late in the decay succession, and protect their hyphae from grazing animal inhabitants of the decay community by growing extremely fine, sharp needles of oxalic acid along their length.

## Honey Mushroom (Stumpers)

*Armillaria mellea*

**Tête de Méduse** (Grande souchette)

The Honey Mushroom is an accomplished fungus. It is a root parasite of a variety of trees, and at any time may be associated with the roots of the majority of the trees in an Algonquin hardwood forest. Although the Honey Mushroom can attack and decay living root cells, a healthy tree can usually hold the parasite at bay. Should the host tree be weakened by another disease or any other stress, the Honey Mushroom will rapidly take over and kill the tree. Sugar Maple saplings up to 10 cm in diameter that are being shaded out by taller trees are commonly killed by the Honey Mushroom. When the tree dies, the fungus quickly sends masses of thread-like cells grouped into hard, black strands called shoestrings up the trunk, beneath the bark. In this way the Honey Mushroom takes advantage of the nutritious inner bark and cambium (the growing layer of the tree trunk), before competing fungi get there. It continues to derive nourishment from the dead tree, but also sends out shoestrings up to 10 metres through the soil to infect another, healthy tree. In the late summer and fall, masses of fruiting bodies, or mushrooms, grow around the base of the dead tree and produce billions of spores that drift away in the breezes to infect distant areas.

In addition to these accomplishments, the Honey Mushroom is able to parasitize another mushroom that grows in similar areas, and cause the deformed fruiting bodies that give *Entoloma abortivum* its Latin name. In other parts of its worldly range, the Honey Mushroom parasitizes a variety of plants, including coffee, tea, rubber, and potatoes, and yet it also forms a beneficial fungus-root partnership with certain orchids. And, on top of all that, freshly cut wood in which the Honey Mushroom was actively growing glows in the dark with a greenish white light. If you see a glimmer in the forest at night, where a dead or diseased maple blew down during the day, it is probably the Honey Mushroom, reminding you how important a fungus it really is.

The Honey Mushroom can be recognized by its clustered beige or brown fruiting bodies that grow at the base of dead tree, on stumps, or on rotting wood. The gills and spores are white, a cottony ring adorns the stalk, and there are often fine points or scales in the centre of the cap.

## Tawny Cystoderma

*Cystoderma granosum*

**Cystoderme granulé**

A mushroom that is small, and not famous for being edible or poisonous, is often without a commonly accepted English name. So it is with this species of *Cystoderma*. However, we think Tawny Cystoderma has a nice ring to it and certainly describes the mushroom's appearance. Both words of its Latin name refer to the fact that the skin of this mushroom is covered with powdery granules. The entire mushroom is a bright buffy orange, and its spores are white. The ring is very firm, and protects the gills until the cap of the mushroom opens to release its spores. This species grows on well-rotted hardwood, and another common relative, *Cystoderma amianthinum*, grows in needle duff of pine forests. *Cystoderma amianthinum* has a smaller ring and a wrinkled, yellow-ochre cap. Species of *Cystoderma* are minor players in the process of decay.

## Gypsy

*Rozites caperata*

**Gitan** (Chapeau ridé)

The Gypsy, like the other mushrooms on this page, has a ringed stalk, but can be distinguished by its rusty brown spores. The cap is pancake brown and unevenly wrinkled toward the edge. Gypsies are common in late summer and fall in woods of White Pine mixed with White Birch and Red Maples. This species is considered a choice edible and a good one for beginners to learn. *Cortinarius corrugatus* (edibility unknown) has a wispy veil like that of the Clustered Changeling on the previous page, rather than the tissue-paper ring of the Gypsy, but is otherwise very similar.

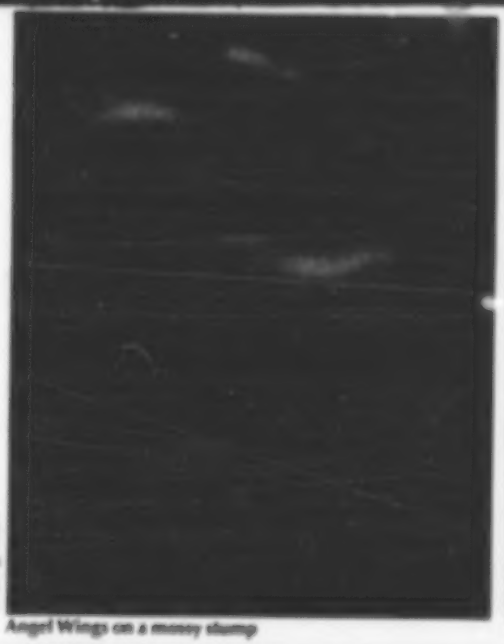
**Fungus-root of pines are forked and stubby. The fungus grows between the outer cells of the root, where it gets food from the tree, and out into the soil, where it finds nutrients needed by the tree.**

## Hunters' Hearts

*Entoloma abortivum*

**Entolome avorté**

Hunters' Hearts come in two forms — the white, wrinkled and contorted lumps that are so characteristic, and silvery, umbrella-shaped mushrooms that are 4 to 7 cm broad by 3 to 10 cm tall. Hunters' Hearts are found in the fall around stumps or rotting wood in the hardwood forest, often mixed with Honey Mushrooms or growing near them. It is thought that the mycelium of the Honey Mushroom parasitizes the developing fruiting bodies of the Hunters' Hearts, and causes them to become aborted and deformed. The spores of the fertile mushrooms are a salmony beige.



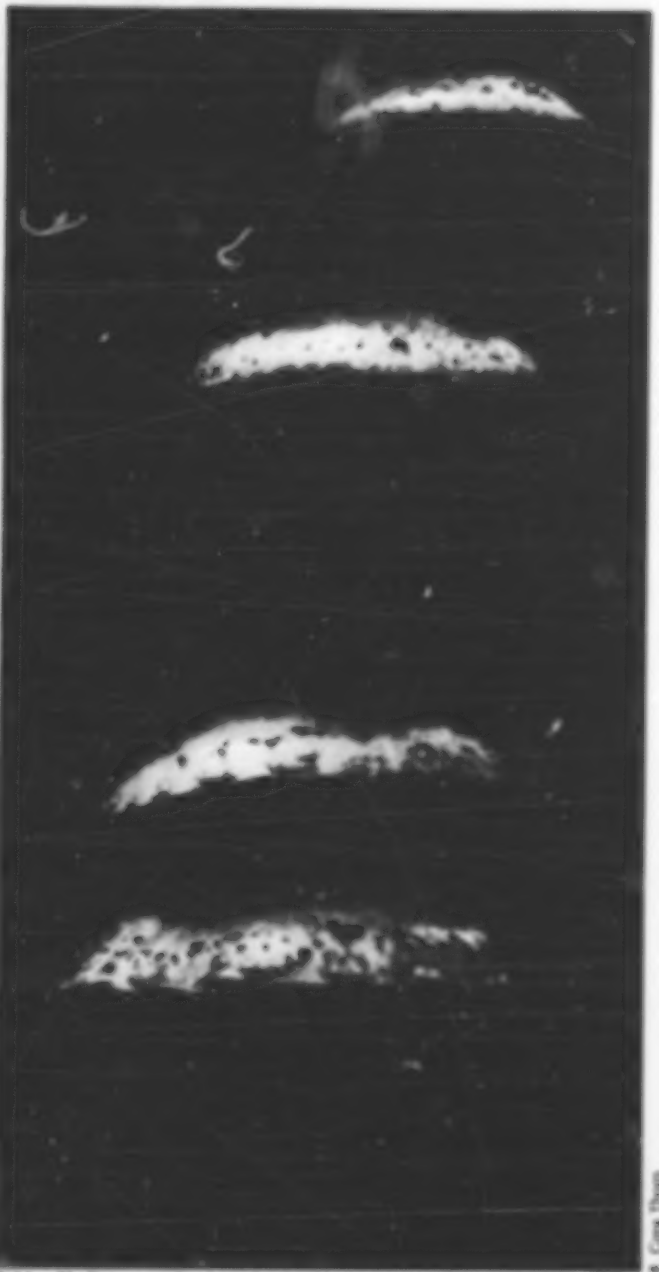
R. Greg Thorn

Angel Wings on a mossy stump

The underside of Split-gills (growing on a twig)

R. Greg Thorn

Tawny Pholiota has salmon-coloured gills and spores



R. Greg Thorn

Golden Pholiotas growing from the dead heartwood of a live sugar maple

Paul D. Johnson

Carnivorous Oyster Mushrooms have a diet of both rotting wood and tiny animals

## Angel Wings

*Pleurocybella porrigens*

**Pleurote étalé**

Delicate, snow-white Angel Wings grow on mossy or bare, well-rotted coniferous wood, and are common from July to September in Algonquin. They are fan-shaped and stemless, with their gills radiating out directly from their attachment to the wood. They are smaller and thinner than the Oyster Mushroom, and usually range in size from 3 to 6 cm broad.

Angel Wings were once classified with the Oyster Mushroom in *Pleurotus*, but they have many microscopic differences from that group, and can not capture and consume nematodes, which all members of *Pleurotus* can. In fact, although all the mushrooms on this page are wood-rotters, only the Oyster Mushroom is known to be carnivorous. It is not known what special nutrient-conserving abilities these other mushrooms have, or whether they may obtain their nutrients in different and still more surprising ways.

## Tawny Pluteus

*Pluteus cervinus*

**Plutée de cerf**

This species has pale pinkish gills that are not attached to the stem, salmon-coloured spores, and a beige to dark brown cap 5 to 8 cm broad. The Tawny Pluteus is common in Algonquin Park on well-rotted hardwood logs, from June until October. Other smaller species of *Pluteus* found in Algonquin are more brightly coloured, with golden or red caps, but are much less common.

## Oyster Mushroom (Oyster Caps)

*Pleurotus ostreatus*

**Pleurote en forme d'huître**

Oyster Mushrooms are common in Algonquin Park from June until October. They grow on hardwoods, often dead Sugar Maples or aspen trees or their fallen trunks, but also grow in the dead, rotting heartwood of injured, living trees. Following heavy summer rains, whole logs may be covered with hundreds of Oyster Mushrooms. Oyster Mushrooms are fan-shaped and grow in overlapping clusters on the wood. They range in colour from pure white to brown or sooty grey. Their spores may be whitish or, more commonly, lilac when fresh and turning yellow as they dry.

Mushrooms that grow in rotting wood face some of the same problems as flowering plants growing in bogs. Both bog plants and wood-rotting fungi have an essentially endless supply of sugars but bogs and rotting wood supply other nutrients in very small quantities, and nitrogen is especially in short supply. This represents an unbalanced diet; neither plants nor fungi can live on sugar alone. Nitrogen is required by wood-rotting fungi to form many compounds, including components of cell walls and the enzymes that enable the fungi to digest wood.

Carnivorous bog plants like the Pitcher Plant and sundew are famous for their ability to capture and digest insect prey as a source of nitrogen and other nutrients. You may be surprised to learn (as we were) that the Oyster Mushroom is one of a number of carnivorous mushrooms that captures and digests minute worm-like animals called nematodes as a source of nutrients-on-the-hoof. Rotting wood is a whole community of organisms — not just dead wood and the wood-rotting fungus, but teeming with bacteria, amoebae and other single-celled animals, and millions of nematodes that move in to feed on the bacteria. Nematodes are tiny packages of nitrogen, each less than a millimetre long, but eaten in large numbers they make a meaty addition to the Oyster Mushroom's all-wood diet. Droplets of toxin that paralyze nematodes coming in contact with them are scattered along the thread-like cells (hyphae) of the Oyster Mushroom growing through the rotting wood. Once a nematode is paralyzed, nearby hyphae branch and grow toward its mouth, then into the body of the helpless and still-living prey. The nematode is digested within its skin and its nutrients are absorbed by the hyphae of the Oyster Mushroom.

Bog plants also have a number of adaptations to help them conserve their hard-won nitrogen, and we should not be surprised that wood-rotting fungi do too. Leatherleaf and Labrador Tea conserve nutrients by being evergreen and not shedding their nutrient-rich leaves every year. As wood-rotting fungi grow through rotting wood, they digest the wood around them, absorb what nutrients they can, and grow on to new areas of the wood. As they grow, their nutrient-rich cell fluids move into the growing cells, so that only empty cells are left behind in explored areas.

The Oyster Mushroom is now being grown commercially in Ontario, and may already appear on your grocery shelves beside the common *Agaricus*.

## Split Gill

*Schizophyllum commune*

**Schizophylle**

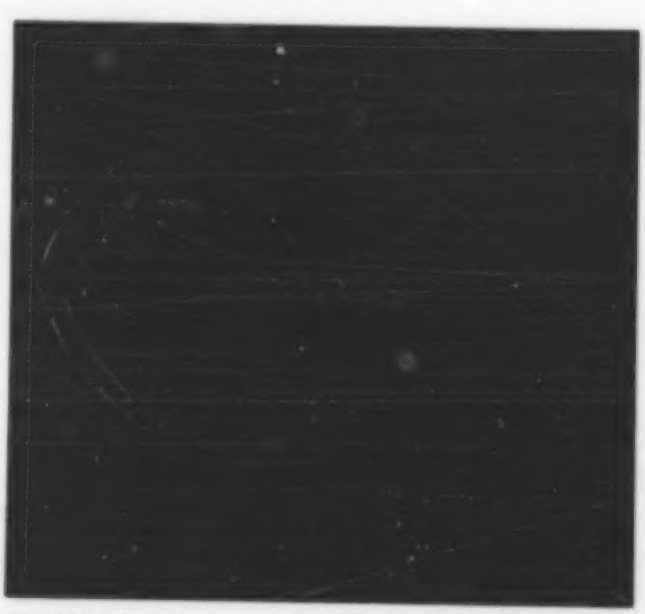
Very common, but often inconspicuous, the Split Gill is marvelously adapted for alternating periods of wet and dry. Its fruiting bodies grow on hardwood twigs and branches, and last all summer and fall. During wet spells throughout that time, it opens its gills and lets its spores fall to the breezes. In the photograph, which was taken on a rainy day, you can see that each gill is split, or composed of two thin ridges. The outside of each ridge is covered with spore-producing cells, but the two facing inner surfaces are sterile. During dry weather, when chances are not as good for spores to land in a moist place to germinate, this mushroom clams up — its split gills curl outwards and save its spores for the next rainy day.

## Colden Pholiota

*Pholiota aurivella s.l.*

**Pholiote dorée**

Species of *Pholiota* grow on wood, have rusty brown spores, usually have a ring on the stem, and have caps that are slimy, scaly, or both. The cap of the Golden Pholiota is slimy and golden yellow, with orange to red-brown scales, and the stem is scaly. It is one of the most common of the nine pholiotas found in Algonquin Park, and grows on hardwoods, often the dead heartwood of living Sugar Maples. The Scaly Pholiota, *Pholiota squarrosoides*, is another common species that grows on fallen logs and has a honey or beige-coloured cap densely covered with coarse, pointed scales. The name *Pholiota aurivella* has been applied rather broadly (*sensu lato* in Latin). Our photograph may in fact illustrate *Pholiota limonella*.



**Thread-like cells (hyphae) of the oyster mushroom have tracked down an immobilized nematode and entered its mouth**

R. Greg Thorn

Pine Cone Mushrooms on a white pine cone

## ▲Pine-cone Mushroom

*Baeospora myosura*

**Agaric des cônes**

While the Honey Mushroom is an accomplished generalist, the Pine Cone Mushroom is a strict specialist. True to its name, it grows only on cones, in this area mostly White Pine cones. These small mushrooms, each less than a centimetre in diameter, grow in late summer and fall on last year's cones. These are often covered with last year's needles (pines shed about a third of their needles each year), so you may have to brush aside some needles to discover this mushroom's true identity.

## Little Orange Log Mushroom

*Xeromphalina campanella*

**Clochette Orangée**

This species may be found on just about every well-rotted conifer log in Algonquin Park, from June until October. It grows in troops, sometimes in vast numbers. A most impressive sight is a huge, mossy old pine log that was felled and then discarded for some defect by the loggers of the last century, covered from end to end with thousands of Little Orange Log Mushrooms. The cap is bright orange to brownish, the gills are pale yellow and curve down the stalk, and the stalk base is tough and brown to black. ▼

## Gartered Galerina

*Galerina paludosa*

**Galerine aux jarretières**

Gartered Galerinas are common during summer and fall in sphagnum bogs, where you will also find a variety of similar fungi that might be loosely called "little brown bog mushrooms". Some species decay the tremendous layers of dead mosses that build up over the years. Others, like our *Galerina*, actively parasitize living sphagnum mosses. Many others are fungus-root partners with bog shrubs and trees, each partner helping the other to grow in a nutrient-poor environment.

The Gartered Galerina seems to be a mild parasite, attacking only the young stages of the plant (the protonema, rhizoids and prothallus). Here, the hyphae of our galerina press up against moss cell walls and withdraw nutrients that the host had stored as starch, usually without penetrating or killing the host cells. In contrast, another little brown mushroom of bogs, the Moss Murderer (*Lyophyllum palustre*), kills cells in all parts of the moss then digests their remains. The Moss Murderer can be found fruiting in the middle of patches of dead sphagnum in the spring or early summer. ▶

Paul D. Johnson

Little Orange Log Mushrooms grow in troops on rotting conifer logs

## Orange Mycena

*Mycena leaiana*

**Mycène orangée**

Flame orange clusters of *Mycena leaiana* are an unforgettable sight, growing on rotting logs in the hardwood forest. They fruit early, and can be found in June, but also occur right through to September when there has been enough rain. The cap and stem are a little slippery when fresh. ▼

R. Lang Thorn

**Orange Mycena is a hardwood forest delight**

R. Lang Thorn

**Gartered Galerinas grow in sphagnum bogs**

## Salmon Nolanea

*Nolanea quadrata*

**Nolanie couleur saumon**

Salmon Nolaneas grow in mixed woods of aspens, Red Maples and conifers, and fruit in late summer and fall. In the same areas you will often find its lemon-yellow relative, *Nolanea murrayi*. Both species are quite small, reaching about 10 cm in height but only 1.5 to 2.5 cm in diameter. Their spores are salmony beige. Many species of *Mycena* have delicate fruiting bodies with conical caps, but their spores are white. ▶

Paul D. Johnson

**All of these Pinwheel Marasmius mushrooms are likely the fruits of one hidden mycelium**

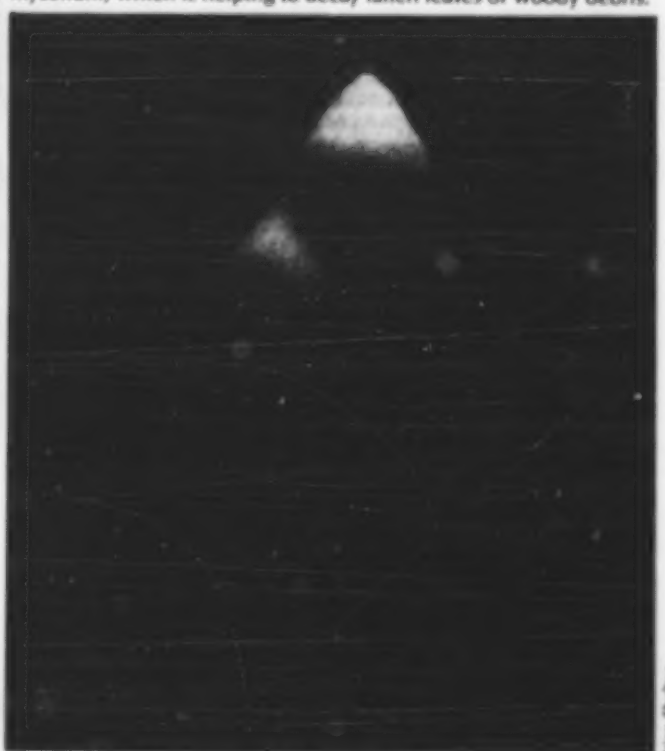
## ▲Pinwheel Marasmius (Horsehair Mushroom)

*Marasmius rotula*

**Marasme petite roue**

After a summer rain, troops of this delicate mushroom appear suddenly on the carpet of rotting leaves in hardwood forests. Between rains they dry up and the caps shrivel, earning their name Horsehair Mushroom by leaving only tufts of wiry black stems. When rains come again, their caps revive, and they produce and shed spores while their surroundings are still moist. In this way the Pinwheel Marasmius, like the Split Gill, produces many spores over the whole growing season, and all during the best times for spore germination.

All of these small mushrooms, which are about 4 to 10 millimetres broad, and 25 to 50 mm tall, are likely the fruits of one mycelium, which is helping to decay fallen leaves or woody debris.



Brian Shelton

**Salmon Nolanea is unmistakable (and poisonous)**

## Slimy Milk Mushroom

*Lactarius mucidus*

**Lactaire muqueux**

The Slimy Milk Mushroom is a common mushroom of northern conifers, but also grows south to the Carolinas. Its white milk is peppery and turns blue-green when it dries on the gills. Taste and smell are important characters for identifying milk mushrooms. Some are peppery, others mild, and the odours of many are remarkable. One small, red-brown species smells a bit like camphor; two grayish species smell like coconut; and a large, orangey-brown milk mushroom of bogs has clear, watery latex and smells like maple syrup!

The number of spores produced by mushrooms is staggering. A.H.R. Buller, a professor of botany at the University of Manitoba from 1904 to 1936, studied spore production in the Commercial Mushroom (*Agaricus brunnescens*) and the Shaggy Mane (*Coprinus comatus*). He found that an average Commercial Mushroom would release 600,000 spores per minute. The Shaggy Mane released 1,600,000 spores per minute, and produced a total of about 5½ **billion** spores.

## Poison Paxillus

*Paxillus involutus*

**Paxille enroulé** (Chanterelle brune)

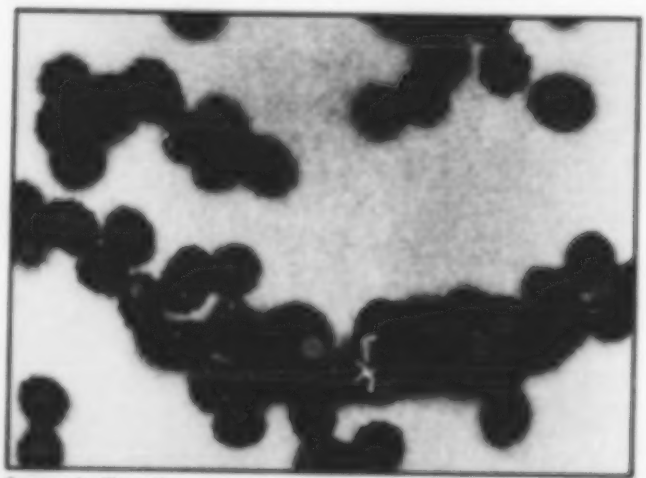
Looking so much like golden brown pancakes, fruiting bodies of Poison Paxillus grow through the late summer and fall in coniferous and mixed woods. Its caps reach 15 cm in diameter, have an inrolled and fuzzy margin, its gills are pale beige, crowded, and curve down the stem, and its spores are dull brown. Poison Paxillus is a fungus-root partner of a great variety of trees. In fact, it is so common and so easily grown in laboratory culture that it is being developed for use in tree nurseries so that seedlings will carry a fungus partner to their planting site. The hope is that perhaps these trees would survive better than if they had to wait for a fungus partner to find them. Paxillus fruits abundantly in stands of Balsam Fir that are dying from heavy attacks of Spruce Budworm. This may indicate that the choice of Poison Paxillus as a commercial fungus-root inoculum might be unfortunate, if paxillus is an opportunistic partner that takes advantage of stressed trees, and possibly helps push them over the edge.

## Funnel Clitocybe (Tan Fairy Funnels)

*Clitocybe gibba*

**Clitocybe en entonnoir** (Cyathiforme de tan)

This is one of the most common mushrooms of mid-summer in the Algonquin hardwood forest. It first appears in late June, and may fruit in flushes through to August. Its tan, funnel-shaped cap with white gills running down the stem make it readily identifiable. Like the Bitter Funnels, above, the Funnel Clitocybe is an important leaf-rotter, recycling the nutrients from fallen leaves to the soil where they can be used for growth of new seedlings and new foliage. Canisbay Campground and the Hardwood Hill Picnic Ground are good places to find this mushroom.



**Spores of milk mushrooms are ridged or spiny**

## Delicious Milk Mushroom (Orange Milk Mushroom)

*Lactarius deliciosus*

**Lactaire délicieux**

The milk mushrooms got their English and Latin names because they bleed a white, coloured, or clear liquid when they are injured (*Lactarius* means milky). The milk mushrooms are an important group of fungus-root agarics, and 30 species have been found in Algonquin Park. Most species are funnel-shaped when mature. The Delicious Milk Mushroom is found under conifers in late summer and fall. It can be recognized by its orange, banded cap and orange milk that turns green in age (and when you cook them)! A close relative, *Lactarius thyinos*, has a slippery stem and milk that does not turn green.

## Chanterelle (Golden Chanterelle)

*Cantharellus cibarius*

**Chanterelle**

Mushroom hunters of Europe and North America consider the Chanterelle to be one of the most highly prized delicacies. The Chanterelle can be recognized by its orange colour, blunt, forking and vein-like gills, and its odour of apricots. The Chanterelle grows on soil or rotting leaves (a False Chanterelle, *Hygrophoropsis aurantiaca*, grows on rotting wood). This species is one that can be searched for by knowing when and where to look. In Algonquin Park, one strain of Chanterelle fruits after heavy rains in July, in woods of aspens and White Birch. These are forests that grow up following fires or other major disturbances. On one occasion, Chanterelles fruited so thickly in the aspen-birch woods on the north shore of Opeongo Lake (cleared by a forest fire in 1953) that the whole woods smelled of apricots. A second major fruiting of Chanterelles in Algonquin occurs in September, under spruce and Balsam Fir. Chanterelles are mycorrhizal, and it may be that their aspen and birch partners provide the quantities of sugars required for fruiting in mid-summer, and the spruces and firs feed their fungus partners more in the fall.

## Bitter Funnels

*Leucopaxillus lateralis*

**Leucopaxilles**

This large, funnel-shaped mushroom may reach 15 cm in diameter, and is similar in shape to the many species of *Clitocybe*. Both groups are most common on rotting leaves, where they are major contributors to the process of decay. Although the features that distinguish *Leucopaxillus* from *Clitocybe* species are mostly microscopic, one field character that is striking is the copious amount of white mycelium that can be found under the leaves around *Leucopaxillus* fruiting bodies. Another feature is that most species of *Leucopaxillus* taste bitter, a bit like the white of a lemon rind. The common name applies to several similar species. *Leucopaxillus lateralis* grows in hardwood forests in mid-summer.

R. Greg Thorn

Slimy Milk Mushroom, showing beads of white milk

R. Greg Thorn

The Delicious Milk Mushroom stains green in age

R. Greg Thorn

Poison Paxillus is a mushroom-root partner

R. Greg Thorn

Chanterelles have blunt, forking gills, and an odour of apricots

R. Greg Thorn

Tan Fairy Funnels are common in early summer hardwoods

R. Greg Thorn

Beneath the leaves surrounding Bitter Funnels is a lot of cottony white mycelium

## Marble Caps

*Hypsizygus tessulatus*

**Chapeaux marbrés**

This species has the look and feel of polished marble, umbrella-shaped caps that reach 15 cm in diameter, and long, curved stems that tend to become hollow or cotton-stuffed in age. Marble Caps are found in late summer and fall, growing from wounds in live hardwood trees, or freshly-cut or fallen logs. This species causes a heartrot (decay of the dead heartwood) of living beech, aspens and Red Maple. A larger species, the Elm Oyster (*Hypsizygus ulmarius*), has been found in Algonquin Park, but like its most common host, the elm, is more common in areas to the south and east of the park.

## Long-rooted Agaric

*Xerula furfuracea*

**Collybie à racine**

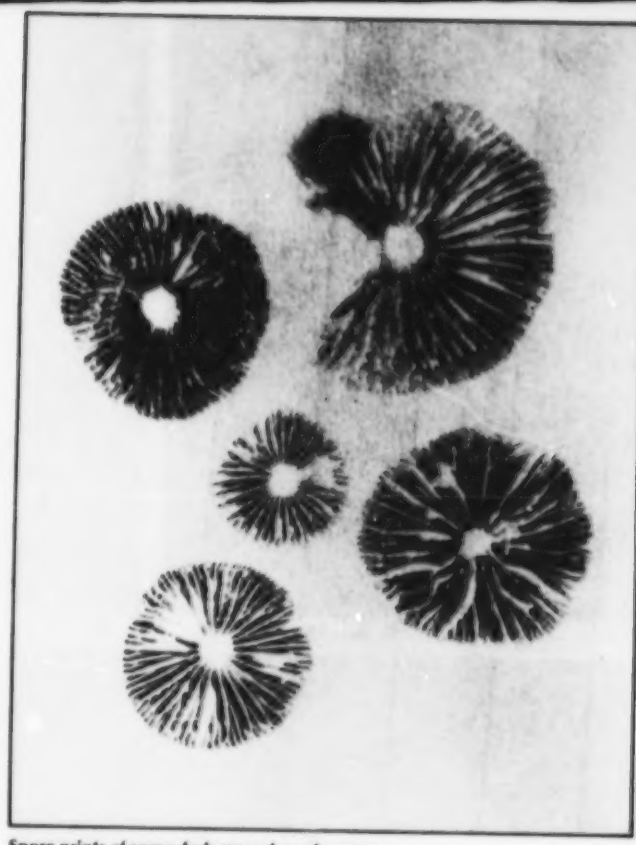
This species illustrates the importance of digging to the base of the mushroom to find all of its identification features. A key feature of the Destroying Angel is the sock at the base of the stem; with the Long-rooted Agaric it is the deeply rooting stem that is so characteristic. This species grows from buried rotting hardwood, and its "rooting" stem is just its way to bring the spore-producing fruiting body above the soil surface. The coffee-coloured cap ranges from 6 to 10 cm broad and becomes slippery or sticky when moist. The stem may reach 30 cm in length, with 10 to 20 cm above the ground and 10 to 20 cm in the soil. The top of the stem is white, but lower down it is grey-brown and slightly scaly. This species was formerly called *Collybia, Oudemansiella* or *Tricholomopsis radicata*, but that species (now called *Xerula radicata*) has not been found in Canada!

## Cranberry Waxy Cap

*Hygrocybe turunda*

**Hygrophore des airelles**

Despite its brilliant red colours, this little mushroom blends in with the red sphagnum mosses and cranberries ripening in moist, open bogs in the late summer and fall. It is consistently found with cranberries, but whether this is simply because both species require similar habitats, or because it is somehow specific to decaying cranberry leaves or roots, is unknown. There are several similar and related species, all one to two centimetres broad, 3 to 6 cm tall, and brilliant red, that are common in varied habitats from July until October. The scarlet waxy caps make us ask why mushrooms are so brightly coloured. What value is their colour to them? As yet, we have few answers.



**Spore prints of some dark-spored mushrooms**

## Tan Collybia (Oak-loving Collybia, Wood Agaric)

*Collybia dryophila*

**Collybie des chênes**

The Latin name of this collybia suggests that it loves oak woods. Oaks are uncommon in Algonquin Park, but the Tan Collybia is not; you will find it growing on rotting leaves and logs in nearly all the forests you visit. Its smooth, golden-brown cap ranges from 2.5 to 6 cm broad, its gills are creamy, crowded, and notched at the stem, the pale stem is marked with vertical or spiral lines, and the spores are white. The Tan Collybia occurs throughout the summer and fall.

## Parrot Waxy Cap

*Hygrocybe psittacina*

**Hygrophore perroquet**

Very few mushrooms are green, and even among the brightly coloured waxy caps, the Parrot Waxy Cap is exceptional. The caps are brilliant emerald green and slimy when fresh and moist, but as they age may change colour from green to orange, like autumn leaves! The yellowish stems are also so slimy that they are nearly impossible to grip. This is a small mushroom that is usually about one centimetre broad (rarely two). It fruits in the fall, and grows in moist mixed woods, often under Red Maple and Balsam Fir.

The waxy caps are leaf-rotting fungi that can be found in nearly all the habitats of Algonquin Park. Some species are particular to bogs, others to fields (such as the Airfield), and many others occur in deciduous or coniferous forests. Many species are white, yellow, orange or red. They take their name from the waxy feel of their gills.

R. Greg Thorn

R. Greg Thorn

**Marble Caps at the base of a living beech; and on a red maple**

R. Greg Thorn

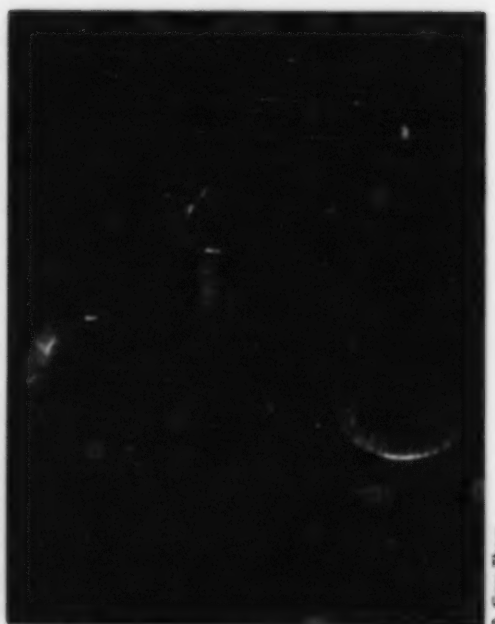
**The stem of a Long-rooted Agaric may be as long beneath the ground as above**

R. Greg Thorn

**Tan Collybias**

R. Greg Thorn

**Cranberry Waxy-caps grow with bog cranberries in the fall**



R. Greg Thorn

**Parrot Waxy-caps in a moist September woods**

## Rosy Russula

*Russula sanguinea*

**Russule sanguine**

A second common and recognizable russula is the Rosy Russula. This species has a scarlet or deep rose-red cap and creamy yellow gills and spores. The stem may be whitish with a pink flush, or entirely rosy-pink. The Rosy Russula prefers moist mixed woods, often of Red Maple, Balsam Fir and spruces.

Odour and taste are important characters for the identification of russulas, as they are for milk mushrooms. The Rosy Russula tastes peppery, but other species are mild. The odour of the Rosy Russula is mild and indistinctive. A slippery, yellow brown species of mixed woods, the Marzipan Russula (*Russula fragrantissima*) smells strongly of the almond candy that gives it its name.

Mushrooms are an important winter food for red squirrel, and russulas rank as one of their favourites. Squirrels carry these mushrooms up trees and hang them from branch forks or stuff them in cracks in the bark. There, the mushrooms dry and are preserved for eating later in the winter.

## Graying Orange Russula

*Russula decolorans*

**Russule décolorée**

The russulas are a large and colourful group that are closely related to the milk mushrooms. Like the milk mushrooms, their fruiting bodies are short, stout, and brittle-fleshed. Their stems are thick, often white, and snap like chalk. Milk mushrooms bleed when they are cut or broken, but russulas do not. Many russulas are yellow, orange, or red (russula is Latin for "little reds"), but others are white, brown, purple or green. Most are difficult to identify. There are probably at least twice as many russulas in Algonquin Park as the 15 that have been definitely recorded.

The russulas are important mushroom-root partners of conifers, birches and beech. The Graying Orange Russula grows in wet conifer woods, especially bogs. It is one of the more easily identified species, and can be recognized by its pale to deep orange cap, white stem that is often flushed with pink, yellowish spore print, and its flesh and gills that turn grey as they dry.

# The Boletes

*Boletales*

**Bolets**

The boletes are sometimes called "sponge mushrooms" because they have soft, spongy, vertical tubes on the undersides of their caps, that take the place of gills in agarics. The inside walls of each tube are lined with spore-producing cells (basidia), as are the surfaces of gills. If you don't have a microscope you can show this by taking a spore print of a bolete, by lying a cap tubes-down on white paper for a few hours or overnight. The spore print will be formed of dots where the tube-mouths were, and white spaces where the walls of the tubes were.

Almost all of the boletes are mushroom-root partners of trees, and some are quite particular about the trees they associate with. *Leccinum* species are common under aspens and birches, and there are characteristics species of boletes that grow with each of Larch, White Pine and Jack Pine. This clue may help you find some of the boletes, or identify the ones you have found.

## Birch Bolete (Red Caps)

*Leccinum aurantiacum*

**Bolet orange**

The Birch Bolete and its close relatives are often abundant in Algonquin in mid to late summer, under forests of aspen and birch. The partnership of the Birch Bolete is probably essential to the aspens and birches in colonizing sites following fires or other disturbances. The fungus partner explores the soil for nutrients and water, and helps the tree partner get by in soils that may have been depleted of nutrients by leaching, and that are susceptible to drought because of exposure.

The Birch Bolete can be recognized by its rusty-orange, felty cap, with small flaps hanging beyond the edge, and the rough reddish markings on the stem. Other common species in this group have black markings on the stem or are whitish, grey or brown.

## Red-pored Bolete (Hemlock Bolete)

*Boletus subvelutipes*

**Bolet à pied velouté rouge**

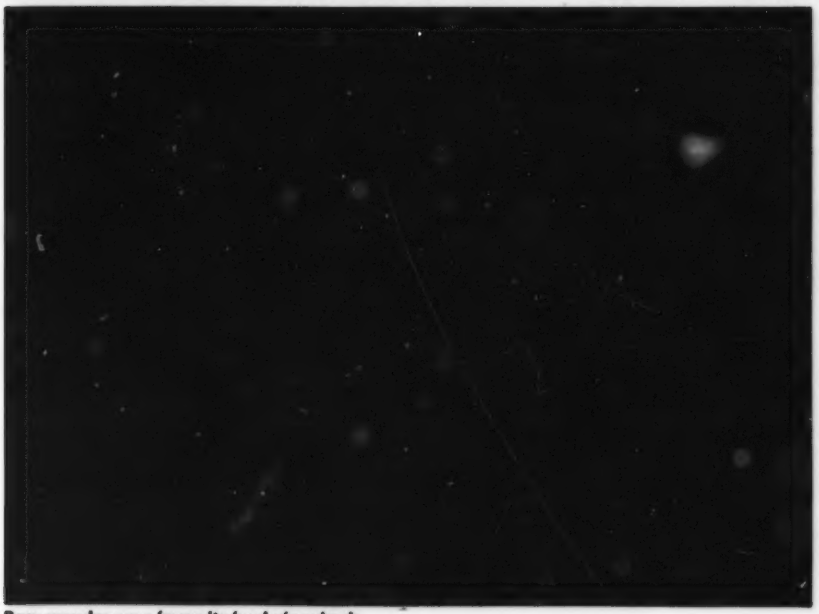
The first thing that you will notice about this bolete (and several similar species found in Algonquin) is that it immediately stains deep blue wherever it is bruised or broken. The Red-pored Bolete has a brick-yellow to brownish cap, up to 20 cm broad, a reddish-orange pore surface, and a rosy-red stem. The combination of blue-staining and reddish pores is generally considered an indication of poisonous species of boletes, but the edibility of this species is not known with certainty. The Red-pored Bolete is relatively common under Hemlocks in Algonquin Park. Some of the best fruitings have been found in Canisbay Campground, but it could potentially be found in any cool, moist Hemlock grove in mid-summer.

## Bitter Bolete and King Bolete

*Tylopilus felleus* — *Boletus edulis*

**Bolet amer** — **Cèpe**

The Bitter Bolete is very common in Algonquin Park, and causes great disappointment to mushroom collectors who mistake it for the King Bolete (*Boletus edulis*). The King Bolete is considered one of the best edible fungi but, alas, is rare in the park. Both species have large, fleshy fruiting bodies with brown caps 10 or 15 cm or more broad and stout stems covered with a striking pattern of chain-like ridges. As the tubes mature, they become flesh-pink in the Bitter Bolete, and yellowish in the King Bolete. The flesh of the Bitter Bolete tastes intensely bitter to most people, but there are some who find it bland. The bitterness is intensified by cooking, and we have not heard of anyone with a dull enough palate that they could actually swallow any of this mushroom, which is not otherwise known to be poisonous. The King Bolete has a sweet, nutty taste, so the taste test is a safe, simple and reliable way of distinguishing the two species. The Bitter Bolete is found under Hemlock and Yellow Birch, where it often grows on rotting wood.



Rosy russulas are a favourite food of squirrels

R. Greg Thorn

Graying Orange Russula in a sedgy bog

R. Greg Thorn

A Birch Bolete with fringed cap and dotted stem

R. Greg Thorn

The spore-bearing tubes of a bolete can be seen in this section of a Red-pored Bolete

R. Greg Thorn

R. Greg Thorn

To mistake the Bitter Bolete (right) for the delicious King Bolete (left) is a bitter disappointment

# Coral Fungi

*(Clavariaceae and similar groups)*
**Clavaires**

Twenty-four species of coral fungi are known from Algonquin Park and these range in shape from simple clubs to highly branched candelabras, or corals. Most are involved in fungus-root relationships, but their role in these partnerships is not yet understood. The Blueberry Club (*Clavaria argillacea*) occurs in late fall among blueberries, but it is not clear if this species benefits the blueberry partner. Three common species are included below.

## Golden Clustered Clubs

*Clavulinopsis fusiformis*
**Clavaire fusiforme**

The brilliant yellow clubs of this species grow clustered from a common base among fallen leaves in cool, moist forests with a mix of deciduous and coniferous trees. In Algonquin Park, they fruit in August and September. Individual clubs are about 3 to 5 cm tall and 4 to 8 mm thick. Several species with similar colours occur as single, scattered clubs, particularly on mossy soil in woods. Some of you may recognize this species as one that was illustrated in a recent set of Canadian postage stamps devoted to mushrooms.

## Rooted Wood Coral

*Ramaria stricta*
**Clavaire etroite**

Several related species of coral fungi are all labelled by this one common name. All are highly branched, with slender, graceful branchlets, all occur on well-rotted wood, and all have whitish "roots" that grow through the wood beneath them. They range in colour from yellowish to beige to pinkish brown. They grow in a variety of forests and, in Algonquin, fruit from August to October. Another paler coral that also grows on rotting wood, the Pixie Crown Coral (*Clavicorona pyxidata*), has branch-tips that look like miniature crowns.

## Cock's-comb Coral (Crested Coral)

*Clavulina cristata*
**Clavaire en crête**

This coral is a species of coniferous forests, and grows in bogs and in spruce or pine woods. It is usually common, but some years it is especially abundant and grows by the hundreds among the mosses and needles on the forest floor. The fine, spiny branchlets make this white or grayish species distinctive. The Cock's-comb Coral grows about 2 to 6 cm tall.

# Tooth Fungi

*Hydnaceae* (and similar groups)
**Hydnes** (Champignons aiguillonés)

Most gilled mushrooms are closely related, but the fungi that produce spores on teeth belong to several unrelated groups. Some are umbrella-shaped, with spines beneath the cap where you would expect gills, and are important fungus root partners. Others grow on rotting wood and can be shelf-shaped or, like the Bear's Head, a mass of spiny arms. Fungi with teeth may seem surprising, but the teeth just represent another way of increasing the spore-producing surface area of the mushroom.

## Bear's Head

*Hericium americanum*
**Hydne tête d'ours**

In the late summer or fall you may find white masses of cascading spines growing from dead hardwood logs. These can be variable in form, but are unmistakable, since no other fungus resembles them. It was recently shown that this common Algonquin species won't breed with similar species from Europe. The teeth grow on branches that arise from a dense base. *Hericium americanum* has short branches with long teeth and was formerly called *Hericium coralloides*, a name that properly refers to a lacy-looking species with long, spreading branches and short teeth that was formerly called *Hericium ramosum*. Mushroom fanciers do not need to be discouraged by the confusion — all varieties are equally delightful in appearance, and equally edible.

## Hedgehog Fungus (Sweet Tooth)

*Hydnum repandum*
**Hydne sinué** (Pied de mouton)

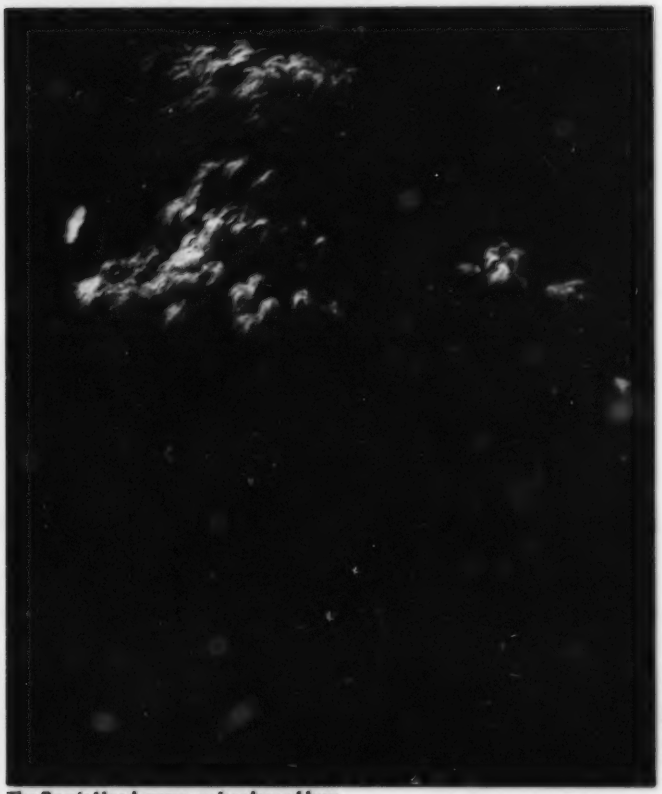
The pale tan or flesh-coloured caps of the Hedgehog Fungus range in size from 4 to 12 cm. Beneath their wavy, umbrella-shaped caps are fine white spines that produce spores over their entire surface. This is a great advantage to successful reproduction since teeth that are 3 to 5 mm long have 10 to 15 times the spore-producing area that a flat underside would have. The hedgehog fungus has fungus-root partnerships with a variety of Algonquin trees, so fruits in many different areas in the late summer and fall.

R. Greg Thorn

Golden Clustered Clubs – several similar species grow singly

R. Greg Thorn

Cock's-comb Coral is common under conifers

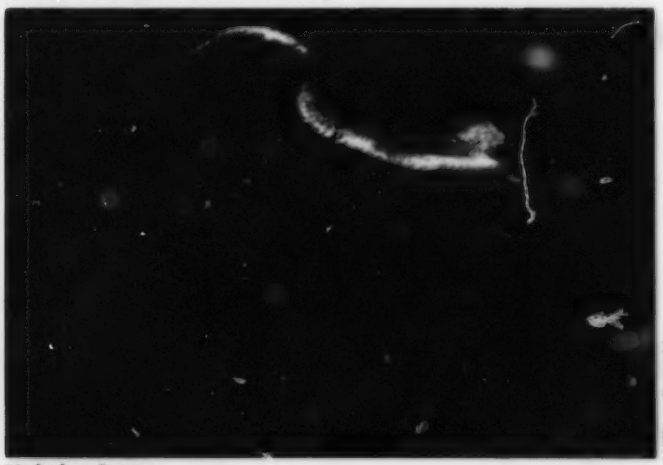


R. Greg Thorn

The Bear's Head grows on hardwood logs

R. Greg Thorn

Rooted Wood Corals have tightly clustered branches



William Reynolds

Hedgehog Fungus

# Polypores

*(Polyporaceae, Ganodermataceae, and poroid Hymenochaetaceae)*

**Polypores**

Nearly 90 species of polypores have been found in Algonquin Park. These are the fungi you may know as the shelf or bracket fungi, although not all species form shelf-shaped fruiting bodies. What they do all have in common are tough or woody fruiting bodies that produce spores in tubes or pores found on the underside. These pores may range in size from two millimetres broad (in *Polyporus mori*, a species common on oak and beech twigs) to so small that you can barely see them, in the Artist's Conch.

The polypores are the most important group of fungi in wood decay, since they are common and very effective at digesting sound wood. The species on this page are frequent on living trees or trees that have recently died, and are often the cause of the decay that brings the trunk crashing to the ground. Take a close look at the wood of the next freshly-fallen tree that you see in the forest. There are two basic types of decay of sound wood, indicating the kind of food used by the fungus that caused the decay. Fungi like the Artist's Conch and the Tinder Conch are able to digest both of the two main chemical components of wood: the cellulose fibers and the lignin that acts like glue to strengthen them and hold them together. This leaves the wood white, soft, and pulpy, and is called white rot. The Red-belt Polypore and the Dry-rot Polypore are able to selectively digest and remove cellulose from wood, but not lignin. The lignin and chemically related residues are reddish brown (they contain tannin, which also colours your tea, and the water of bogs). Brown rot leaves the wood crumbly and often broken into cubes.

## Artist's Conch

*Ganoderma applanatum*

**Polypore des artistes** (Polypore aplani)

The Artist's Conch is the common, grayish-brown, wedge-shaped polypore that you will find on dead or dying hardwoods anywhere you go. Unlike the Lacquered Polypore, which grows to full size in a single season, the Artist's Conch and some of the other hard, woody polypores grow year after year, adding both width and depth to their fruiting bodies. It is called the Artist's Conch because it is possible to scratch a drawing through the soft, white young tubes into the dark brown layer above, and this drawing will last and last if the fruiting body is dried. Unfortunately, this practice is not recommended in Algonquin Park, since the Artist's Conch fruiting bodies take several years to reach the size that you might pick for a sketch-board. Although mushroom collecting is not usually damaging, if even one in a hundred of Algonquin's visitors picked an Artist's Conch to draw on, there would soon be none left for anyone else to see.

The aging conchs are home to a number of insects, including Warty Darkling Beetles (tenebrionids).

## Lacquered Polypore

*Ganoderma lucidum*

**Polypore laqué**

This strikingly beautiful polypore grows on hardwood trees, particularly sugar maple in Algonquin Park. The fruiting bodies, which can reach 30 cm in diameter, develop in a single season. They begin growth in June as soft, white and orange knobs, soon fan out, and both the stalk and upper surface become heavily lacquered shades of burgundy.

A similar species, the Hemlock Polypore (*Ganoderma tsugae*) grows on Hemlock stumps and logs. As you might imagine, the Hemlock Bluff Trail is a good place to look for this species, but it is common everywhere in Algonquin where Hemlocks are found.

## Tinder Conch

*Fomes fomentarius*

**Amadouvier**

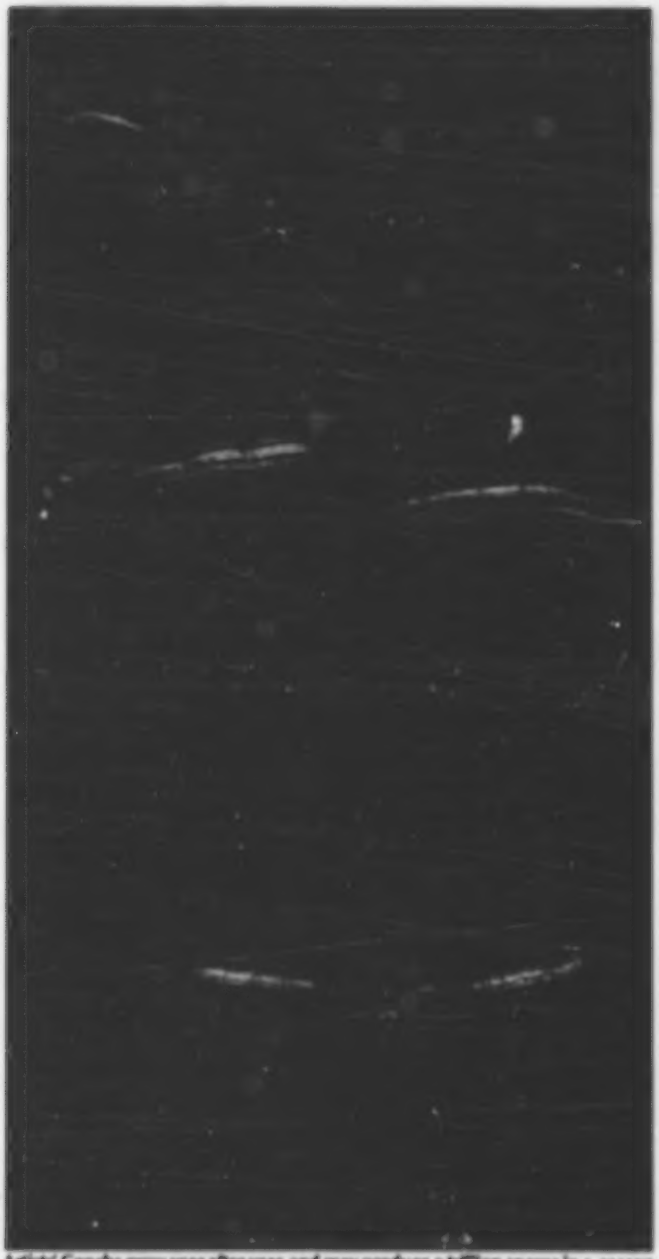
The Tinder Conch is common in Algonquin Park on dead hardwoods of any kind. It is found throughout the northern hemisphere, and got its common and Latin names from the fact that the fruiting bodies of this fungus were dried, powdered, and used as tinder to light fires, or to carry a glowing coal in. The fruiting bodies of the Tinder Conch are perennial, but not all the lines on the upper surface represent yearly growth rings. A better way to age a Tinder Conch is to cut one in half vertically, and count the dark horizontal lines running through the pore layer. Only the bottom, youngest layer of pores produces spores.

## Red-belt Polypore

*Fomitopsis pinicola*

**Polypore à ceinture rouge**

The Red-belt Polypore grows on conifers, either on dead stumps and logs or on wounds in live trees. Its most common host in Algonquin is White Spruce, in which it causes such a serious heartrot that the trunk is often weakened to the point of snapping in a storm. Picking the fruiting bodies will not help the tree. By the time fruiting bodies are formed, the fungus has been rotting the heartwood for 3 to 5 or more years, and in fact they may not form at all until after the tree has fallen. The fruiting bodies are perennial, and will produce trillions of spores over their 5 to 10 year lifespan. A few of these spores may land in wounds that lead to the heartwood of living conifers, and start the cycle again. The red and white bands at the margin of actively growing fruiting bodies make this species very distinctive.



R. Greg Thom

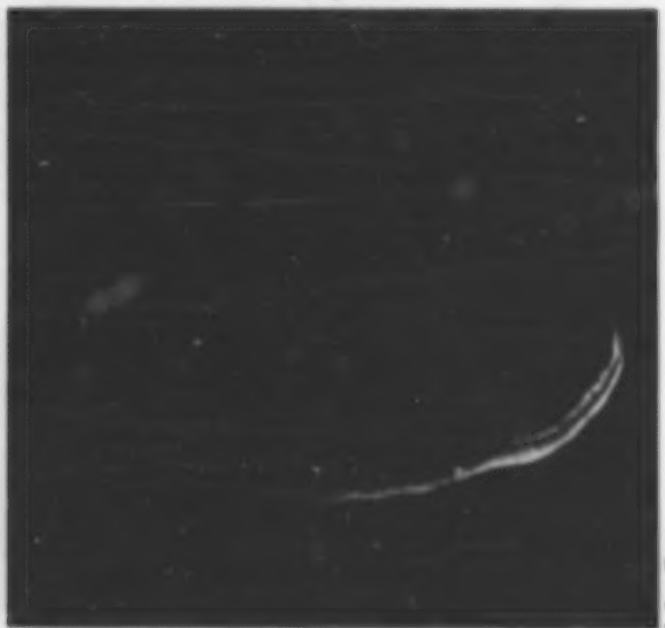
Artists' Conchs grow year after year, and may produce a trillion spores in a season

R. Greg Thom

Tinder Conchs were once used to help light fires

Algonquin Park

Lacquered Polypores can grow to 30 cm in one season



R. Greg Thom

A fluid-filled Polypore on a white spruce

## Winter Polypore

*Polyporus brumalis*

**Polypore d'hiver**

Because of its umbrella-like shape, unusual in a polypore, you may mistake the Winter Polypore for a gilled mushroom, until you look at its underside. There, you will find the creamy white pores that reveal its true identity. The cap and stem are sooty brown and the cap is commonly 4 to 6 cm broad. As its name suggests, the Winter Polypore fruits in late fall, or during warm periods in the winter and early spring. Its fruiting bodies are tough and persistent, and can be found throughout the year. The Winter Polypore grows on hardwood twigs and branches, and evidently can survive the times when these branches, lying above the ground, dry out during the summer. Another umbrella-shaped polypore, *Coltricia perennis*, is commonly found growing on the ground along paths. It is rusty brown all over, and has concentric rings on its upper side.

## Dry-rot Polypore

*Gloeophyllum sepiarium*

**Polypore des clôtures**

This polypore occurs naturally on conifers, and grows readily on coniferous wood that we humans use in buildings and outdoor construction. Despite the name Dry-rot Polypore, wood must have a high moisture content for this species to grow in it. This is hard to avoid in wood used outside, and once it is established, the Dry-rot Polypore causes a serious brown decay. Ranger cabins, railway trestles, and buildings of depot farms and loggers' camps — historic log structures that are reminders of Algonquin's past — are gradually disappearing, a process that is aided by the rot caused by this fungus.

The Dry-rot Polypore is readily recognized because of its striking colours, and the gill-like pores on its underside. Its fruiting bodies are persistent and can be found throughout the year.

# Crust Fungi

*(Corticiaceae, Thelephoraceae, and groups without pores or gills)*

**Champignons en croûte**

If you consult the checklist of Algonquin Park fungi, you will find that the crust fungi includes about 200 species, making them the second largest group. Because they are inedible, they receive little attention from mushroom collectors. Since they have neither gills nor pores, and often grow as crusts on dead wood, they are both easily overlooked and difficult to identify, but that is not to say they are unimportant. This group includes many important wood-rotters, and some that form fungus-root partnerships. Two of the more conspicuous members are included.

## Earth Fan

*Thelephora terrestris*

**Éventail terrestre**

The fan-shaped fruiting bodies of this species arise from the ground, or they may climb twigs or living plants and surround or be suspended from them. Its fruiting bodies form in late summer and fall, and are 2 to 10 cm broad, dark brown, with concentric bands, and have a pebbly, pale cocoa-brown underside.

The Earth Fan forms mushroom-root relationships with many species of trees. It is common, widespread, and often forms fruiting bodies among seedlings in tree nurseries, where spores may have drifted in from surrounding forests. In Algonquin Park, the Earth Fan is especially common in spruce bogs, and on sandy soils under pines.

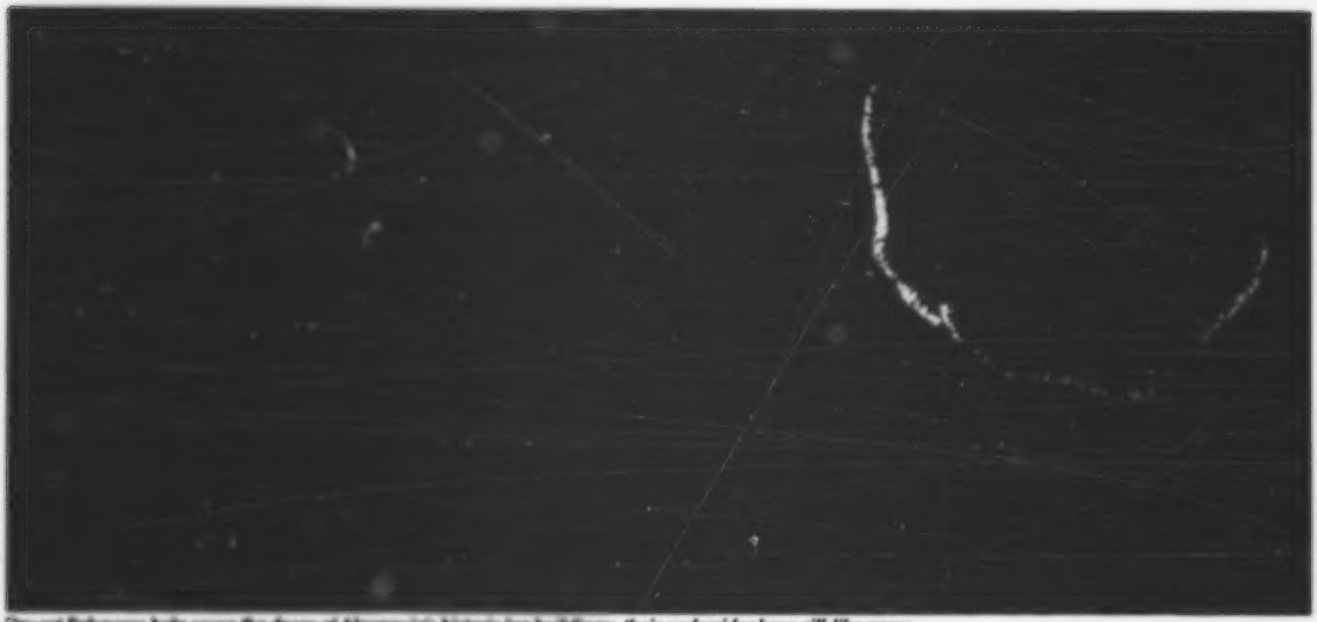
## Purplish Poplar Crust

*Punctularia strigosozonata*

**Croûte pourprée des peupliers**

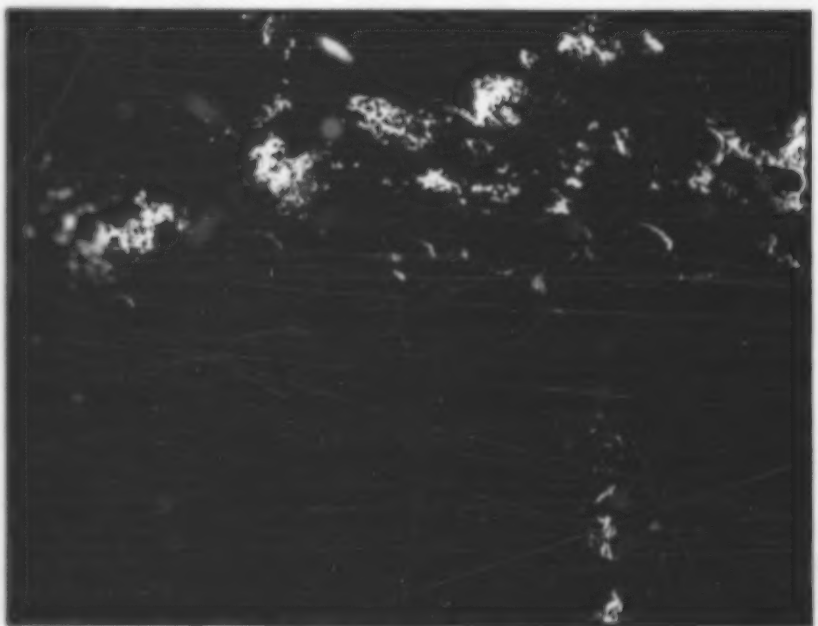
As its name implies, this species is found on poplars (aspens), usually growing on recently killed branches. These branches, whether still hanging on the tree, or lying above the ground, dry out many times over the course of a year, but this does not discourage the Purplish Poplar Crust. It manages to decay the poplar branches during wet periods, and survives through the dry times by means unknown. Its fruiting bodies are long-lived, and they too are adapted to wetting and drying. In wet weather, even in warm, moist spells during the winter, the fruiting bodies quickly generate basidia and a crop of spores. When they have shed their spores, the basidia collapse. During dry weather the fruiting body is sterile and drought-resistant, but ready and waiting for the next rains.

Winter Polypores fruit late in the fall, but can be found throughout the year



Dry-rot Polypores help cause the decay of Algonquin's historic log buildings; their undersides have gill-like pores

Earth Fans are fungus-root partners of many trees



Purplish Poplar Crust can withstand winter and drought

# Puffballs and Relatives

*(Gasteromycetes)*
**Vesses de loup**

The literal translation of the Latin name of these fungi is "stomach fungi". Puffballs and their relatives produce their spores on basidia that are enclosed in a stomach-like sack, rather than on exposed surfaces like gills, pores or teeth. Different members of the group have developed a marvelous variety of ways of getting their spores out of the sack-like fruiting body and spread to new environments. Most fungi in this group derive their nutrients from mushroom-root relationships, but some are capable of wood decay.

## Pear-shaped Puffball

*Lycoperdon pyriforme*
**Vesse de loup en forme de poire**

The nutrient-poor soils of Algonquin Park are not suitable for the Giant Puffball, which park visitors may know from their home areas. Instead, several species of smaller puffballs are common in Algonquin, during the late summer and fall. One of these is the Pear-shaped Puffball. Huge masses of hundreds of Pear-shaped Puffballs may cover the length of well-rotted hardwood logs. Individual fruiting bodies are 2 to 5 cm tall, shaped like a pear with the swollen end up, and smooth or covered with fine, mealy grains. When they are young their insides are soft and white, with a texture between a regular mushroom and a marshmallow. As they mature, their innards first turn yellowish olive, then brown and powdery — a mass of spores. As the spores ripen, a small hole develops in the top of the fruiting body. Rain-drops that land on a puffball tap its thin skin, and force out a cloud of spores that drift away in the wind. Spores released during a rain-storm will have a good chance of landing in a moist environment suitable for germination.

If you are considering eating any of the smaller puffballs (they may be small, but you can find a lot of them), be sure to cut them from top to bottom to be sure that they are young, fresh and white, and more importantly, that they really are puffballs and not the button stage of a mushroom such as the Destroying Angel. There should be no signs of a developing stem, cap or gills — an error could be deadly.

## False Puffball

*Scleroderma citrinum*
**Scléroderme vulgaire**

The False Puffball is yellowish, scaly, and almost as tough as a squash-ball. When they are young, their insides are solid and purplish. False Puffballs are common in Algonquin Park, and fruit from July to October. They often grow in sandy soil under conifers, such as along the old railway near highway 60, but they can also be found on well-rotted stumps in mixed woods. False Puffballs do not release their spores through a small hole in the top of the fruiting body — a rain-drop would not dent their thick skins. Instead, their spores are sometimes carried away by insects and small mammals that chew the fruiting bodies, or are simply blown away when the False Puffball breaks open. False Puffball spores have ridges, pits and wings that help them stay afloat in the breeze longer than their large size would ordinarily allow. These ridges and pits also make the spores relatively waterproof. By preventing water from coating their surface, the spores are able to dodge rain-drops as they float along on the breeze.

## Earth Star

*Geastrum pectinatum*
**Géaster**

Earth Stars are really just puffballs that have developed arms like a starfish. When they are young, the arms are curled around the puffball part of the fruiting body. Earth Stars often develop slightly below the surface of the ground, and in the case of the species illustrated, the arms have actually curled backwards to push the earth star out of the ground and raise it above the surface on stilts. Spores are released by rain-drops, as in the puffballs. Earth Stars often have a fringe of stiff hairs around the mouth of the pore so that it is easier for spores to get out than for insects or other animals to get in to eat the mature spores.

# Jelly Fungi

*(Auriculariales, Dacrymycetales and Tremellales)*
**Champignons gélatineux**

The jelly fungi are a peculiar group that have a great ability to survive and make use of alternating periods of wet and dry weather. In dry weather the fruiting bodies of jelly fungi are barely visible as thin, shiny crusts. After extended rains, this crust takes up water and swells into a jelly-like mass that produces spores over its entire surface. Most jelly fungi grow on dead wood, and may be important in wood decay.

## Orange Witches' Butter

*Dacrymyces palmatus*
**Dacrymyce palmé**

Orange Witches' Butter can be found on dead coniferous wood after heavy rains in any season. Even during a winter thaw, with snow all around, the tiny, dark orange, and inconspicuous dried fruiting bodies of this species can take up enough water to swell to their full size and colour. Their flesh is really made up of a few cells scattered through a liquid-filled jelly. The extra water contained in their swollen fruiting bodies helps to carry them through short periods of low humidity. When it is really dry out, the jelly shrinks to form a tough, hard substance like fingernails, that protects the actual cells of the fungus from drying out and dying. This species is particularly common on trunks of Balsam Fir that have been killed by the Spruce Budworm.

## Black Alder Jelly

*Exidia glandulosa*
**Gelée noire des aulnes**

This species is common in Algonquin Park on dead branches of alder, a shrub that forms dense thickets along lake shores and in low, wet places. Their fruiting bodies swell to look like shiny black buttons after heavy rains, then shrink to form a shining paint-like crust in dry weather. The most notable thing about the Black Alder Jelly is the impression it leaves when you grab a branch covered in its fruiting bodies as you struggle though an alder tangle in the rain.

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Crowds of Pear-shaped Puffballs cover a rotting log

When puffballs mature, spores are released through a pore at the top

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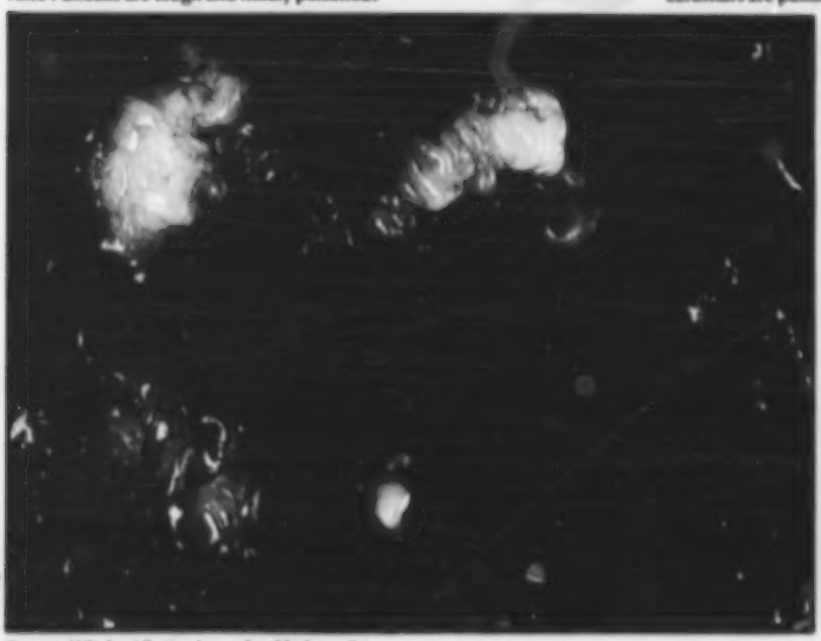
False Puffballs are tough and mildly poisonous

R. Greg Thorn

Earthstars are puffballs with starfish-like arms



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Orange Witches' Butter (on a dead balsam fir)

R. Greg Thorn

Black Alder Jelly

## References

We hope you have enjoyed this introduction — necessarily brief and incomplete — to the mushrooms and other fungi of Algonquin Provincial Park. For more information and help in identifying mushrooms, we suggest you take advantage of the scheduled mushroom hikes offered during July and August in the Parkway region of Algonquin, or take your questions to the Park Museum. The naturalist on duty will be glad to answer your questions.

You may also wish to acquire or consult the references listed below.


1. Checklist of the Conspicuous Fungi of Algonquin Provincial Park. Algonquin Park Technical Bulletin No. 6, 1988.
2. Mushrooms of North America by Orson K. Miller, Jr. E.P. Dutton, New York, 1978, 368 pp.
3. The Audubon Society Field Guide to North American Mushrooms by Gary H. Lincoff. Alfred A. Knopf, Inc., New York, 1981, 928 pp.
4. Flore des Champignons au Québec by René Pomerleau. Les Éditions La Presse, Montréal, 1980, 654 + xvi pp.
5. Edible and Poisonous Mushrooms of Canada, rev. ed. Information Canada, Ottawa, 1979, 326 pp.


## Credits


Many of the photographs by Greg Thorn were taken while he was employed by Professor G.L. Barron of the University of Guelph, whose generous permission to publish them here is gratefully acknowledged.

Drawings by **Katheryn MacQuarrie**


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**WARNING: Do not use this guide alone to identify any mushrooms intended for food. Please consult a field guide, such as those listed above, or seek expert advice.**

Please do not collect mushrooms along the self-guiding trails in Algonquin Park. The people who follow you will not see and enjoy the mushrooms that you pick.